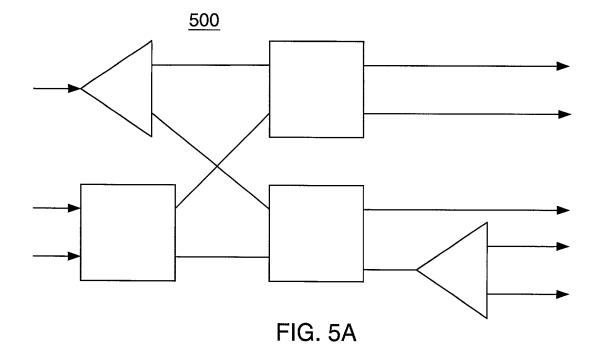
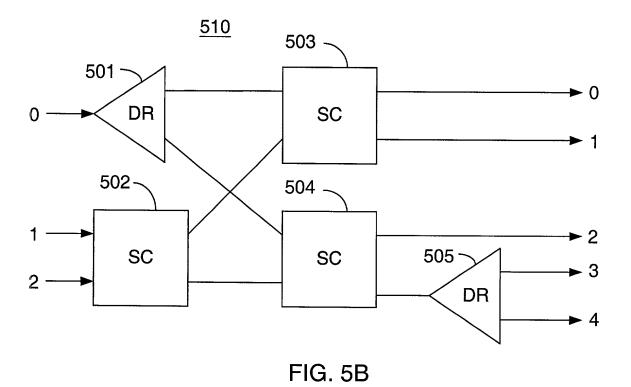


FIG. 4





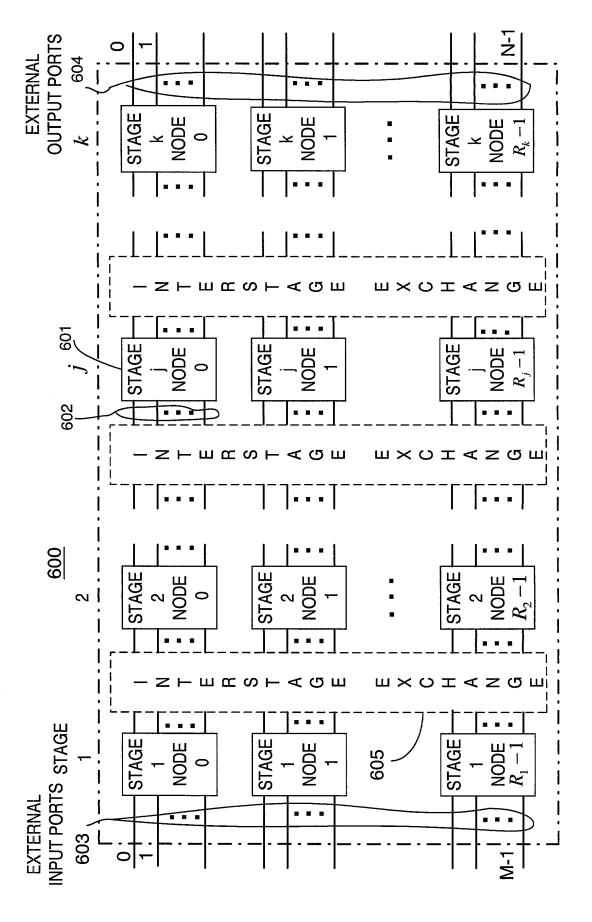
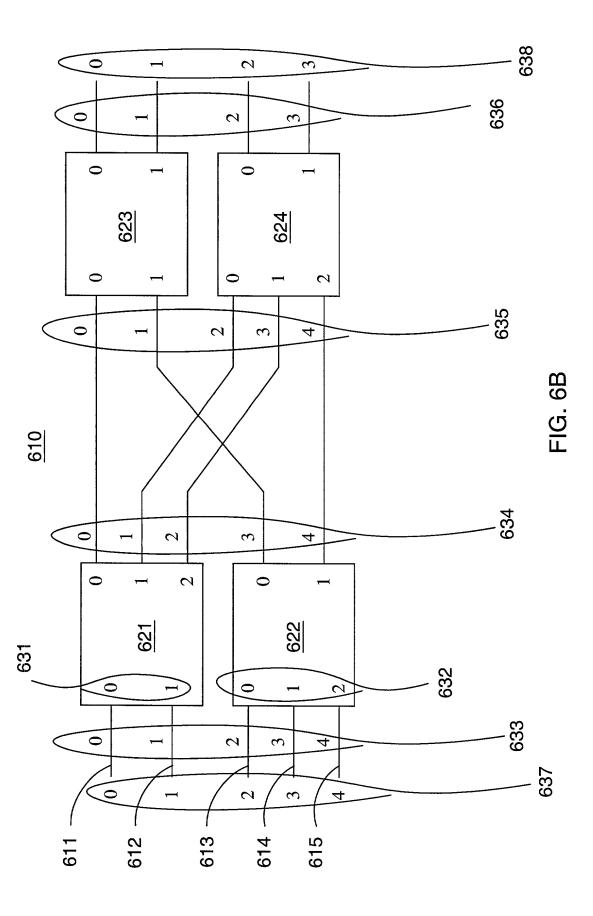
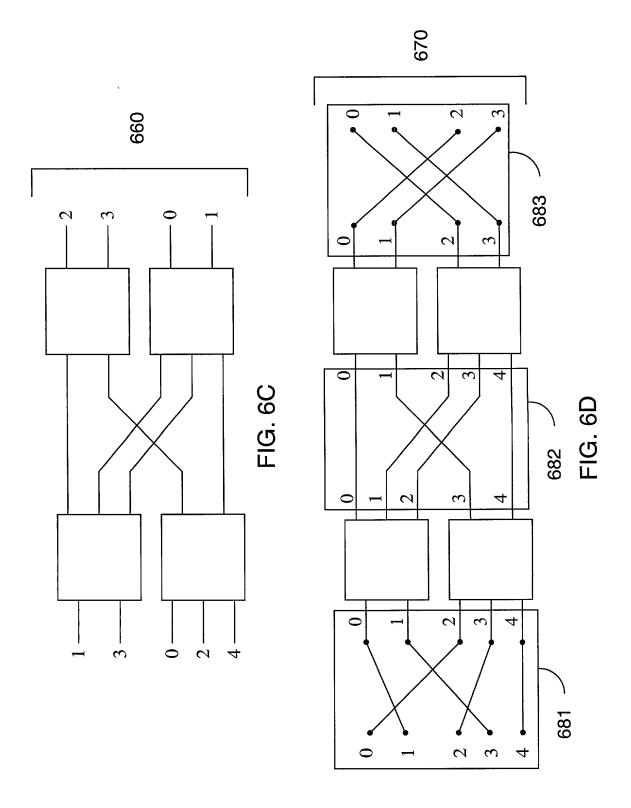
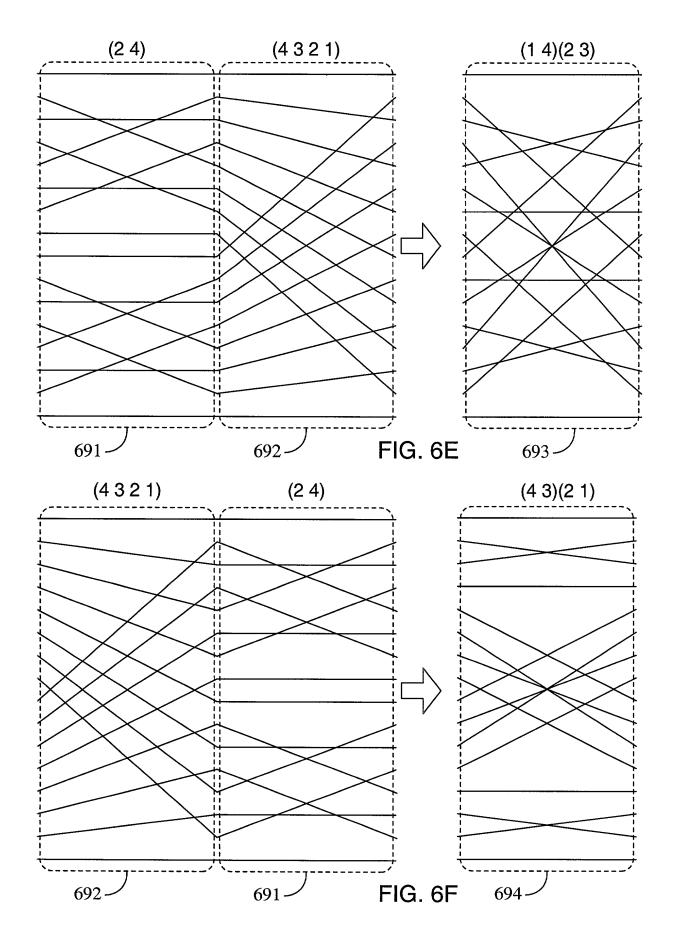


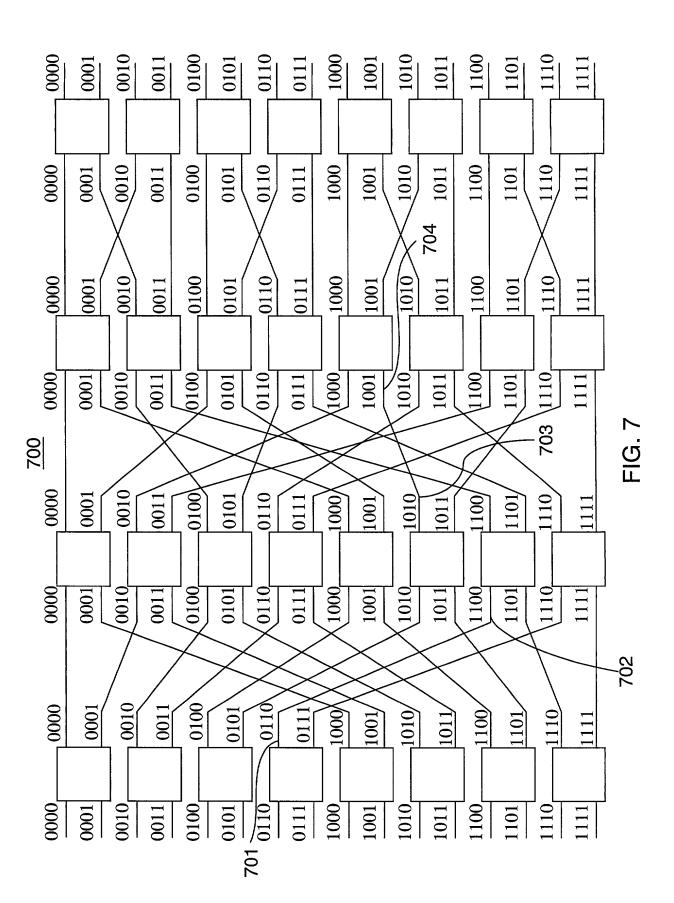
FIG. 6A



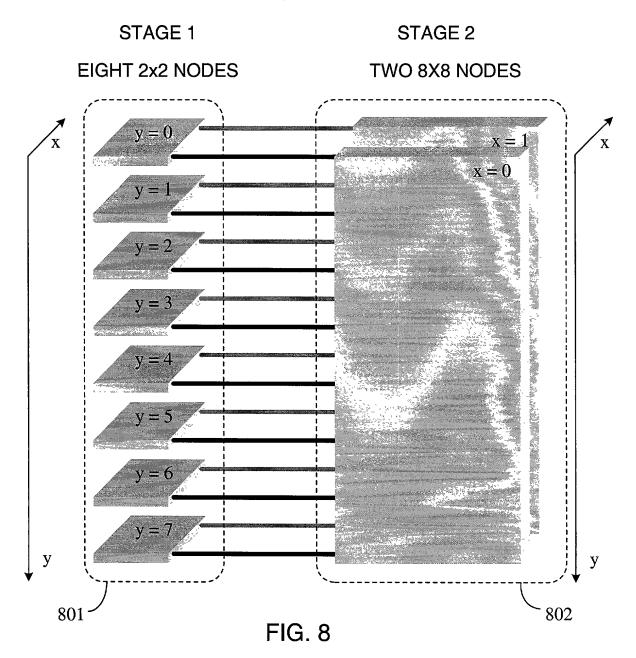
rulia e raji

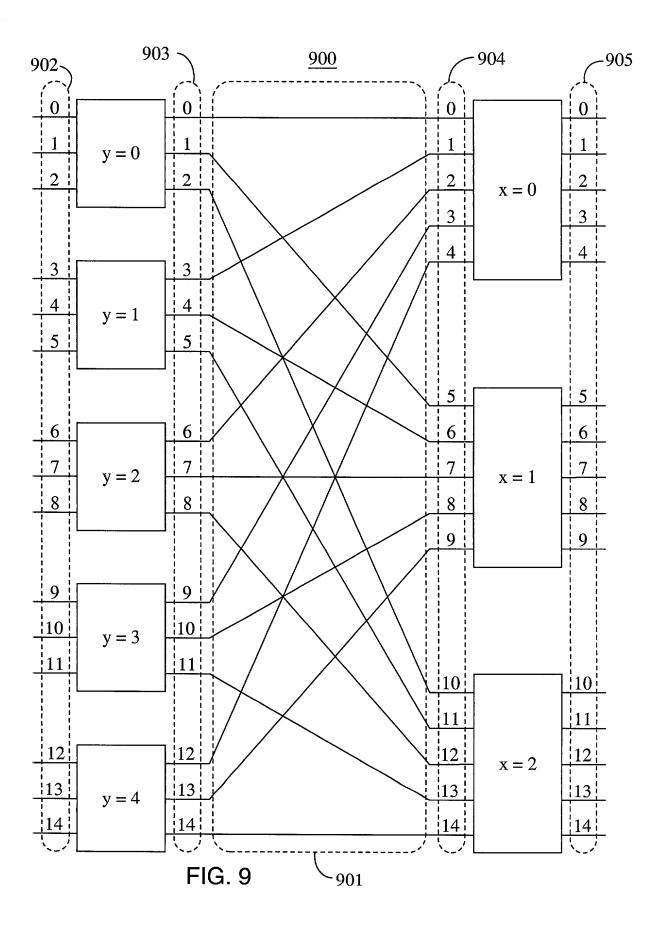




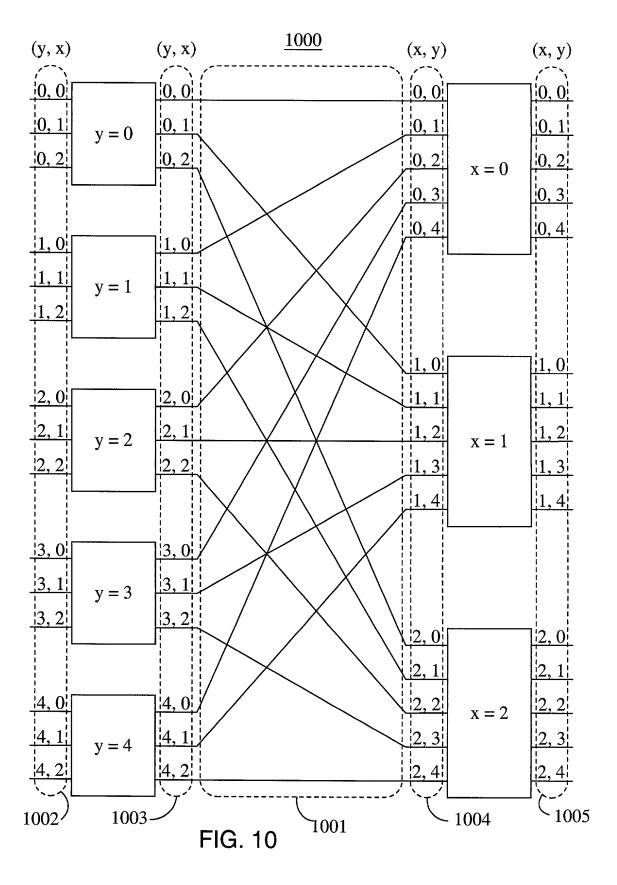


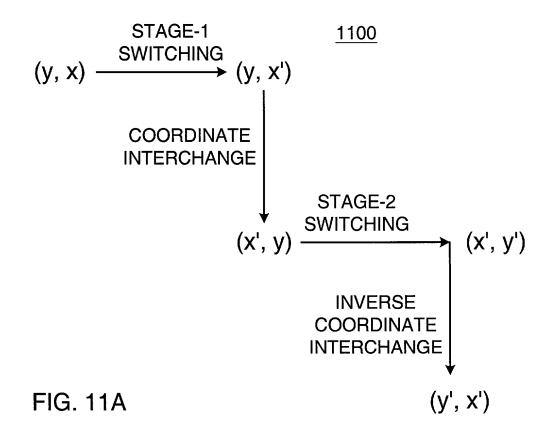
#### <u>800</u>

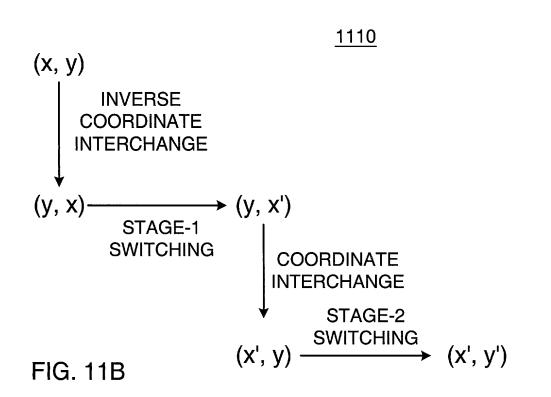


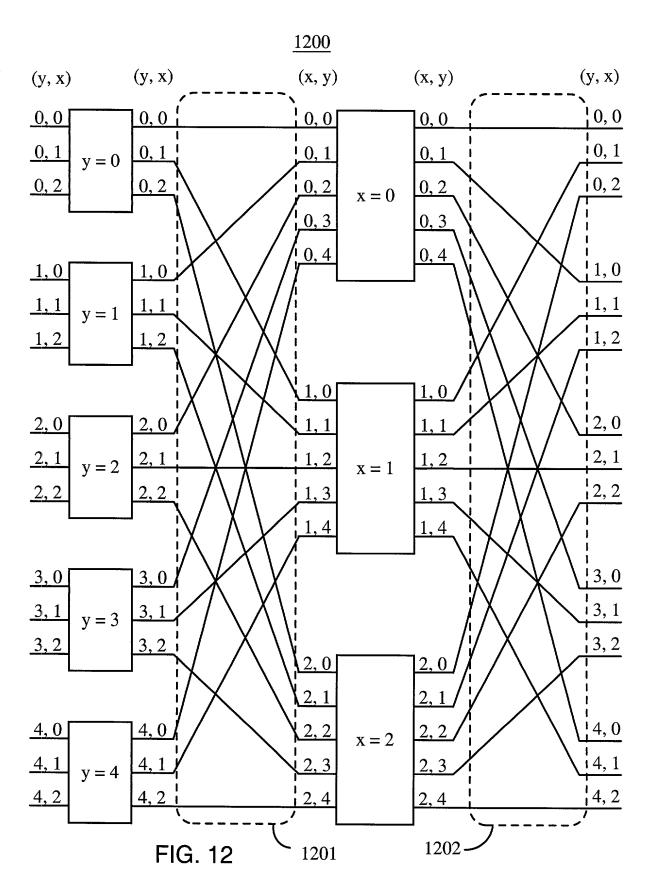


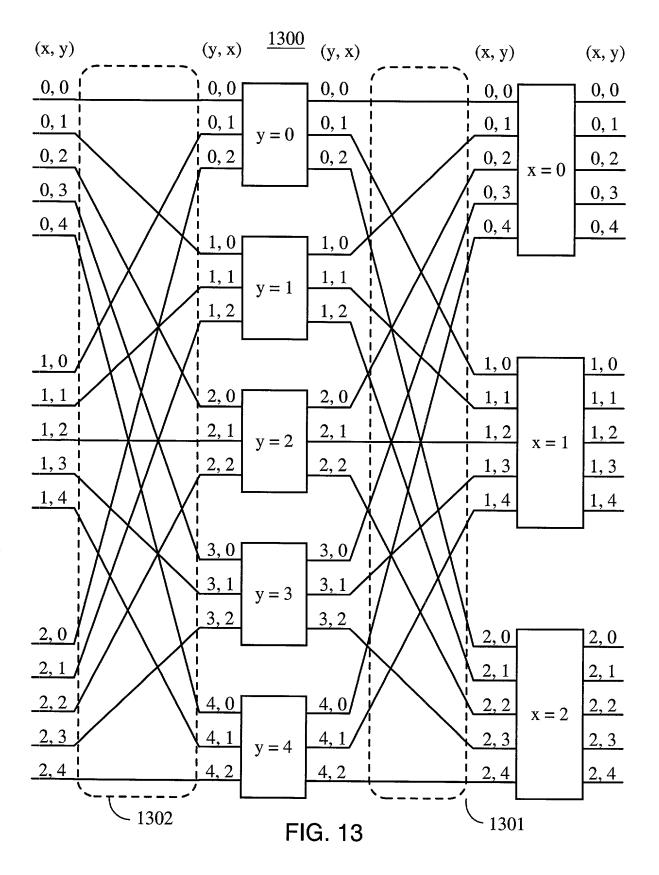
117 1199

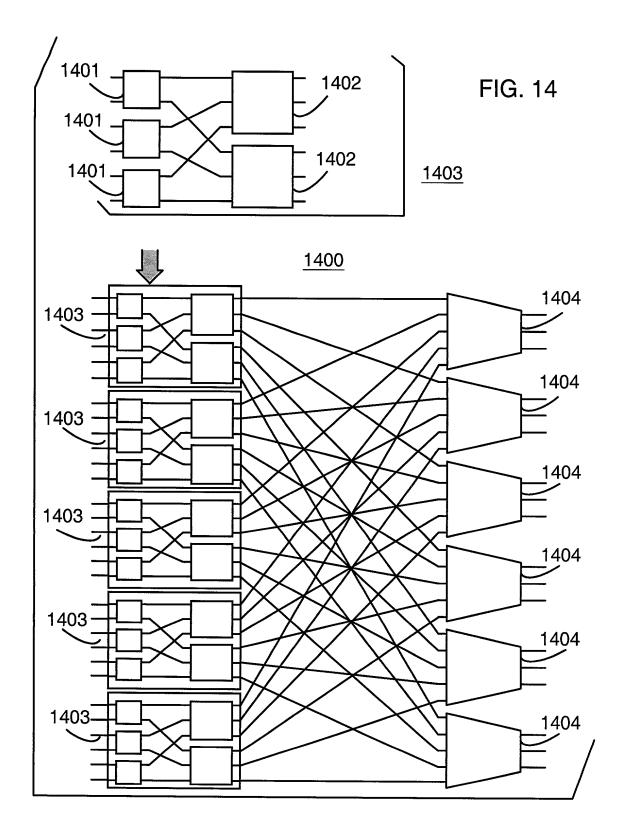












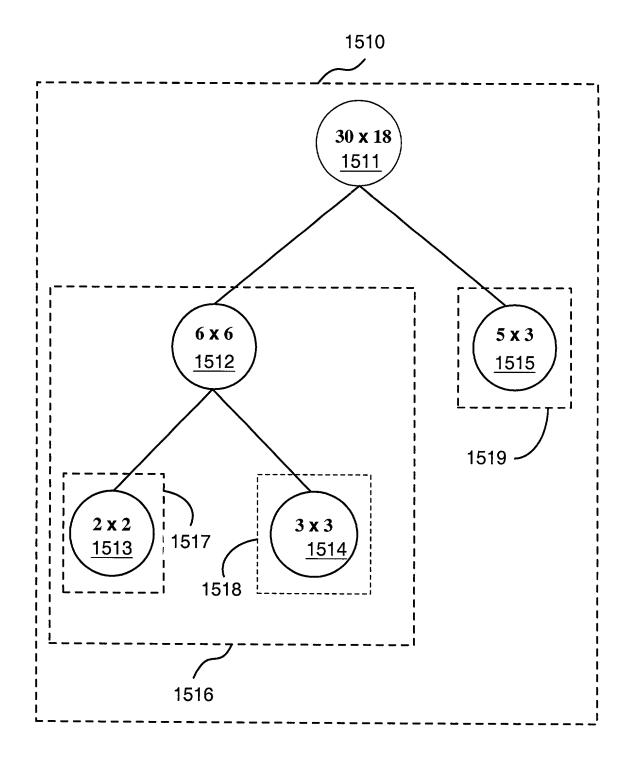
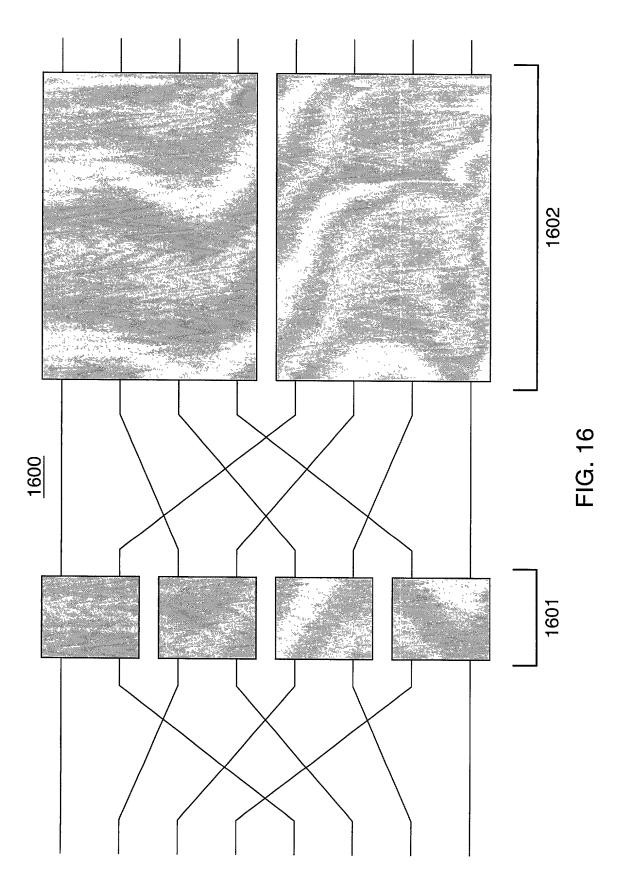
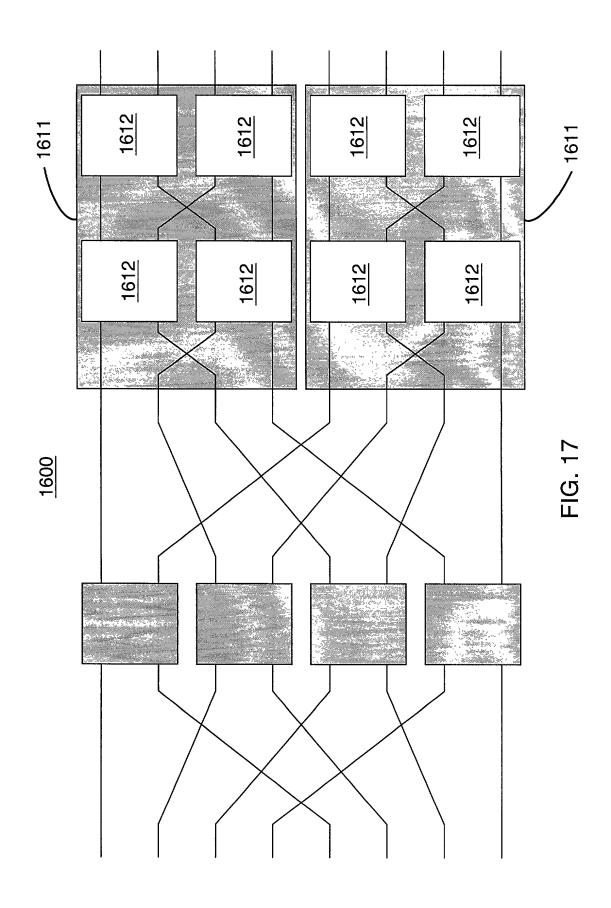
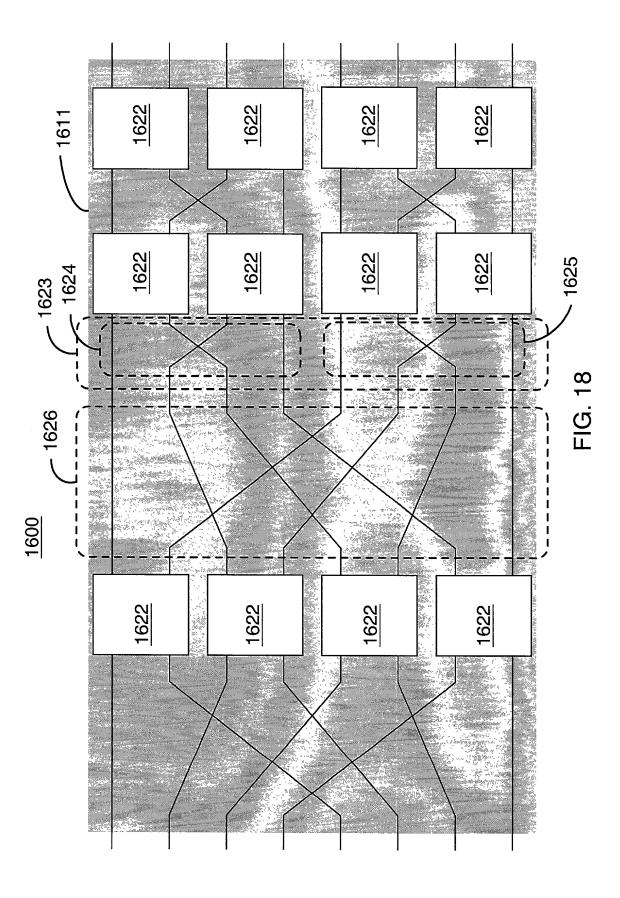
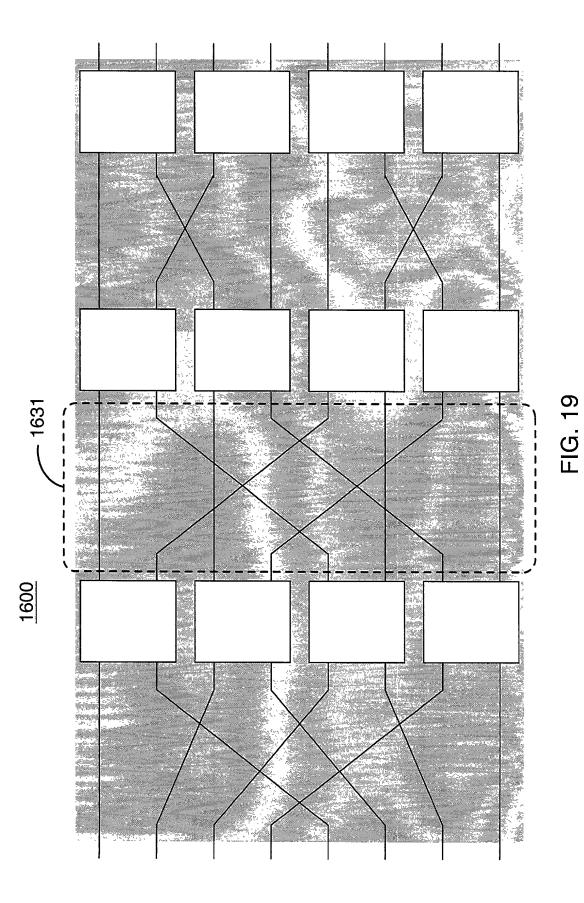


FIG. 15









11 (1) 11 11

# <u>2000</u>

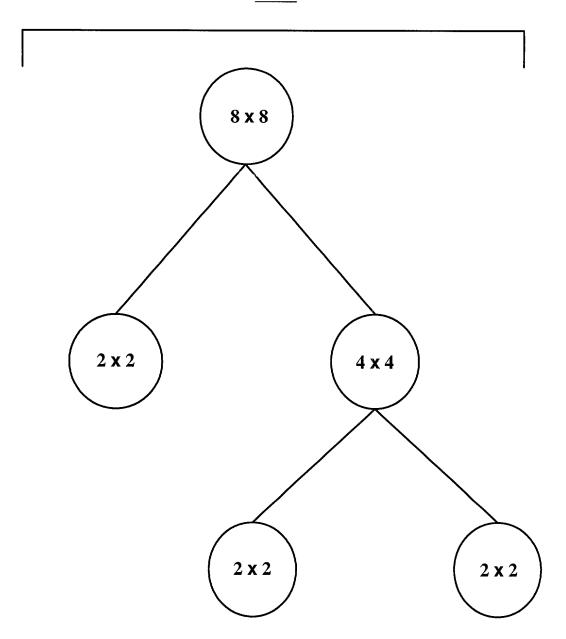
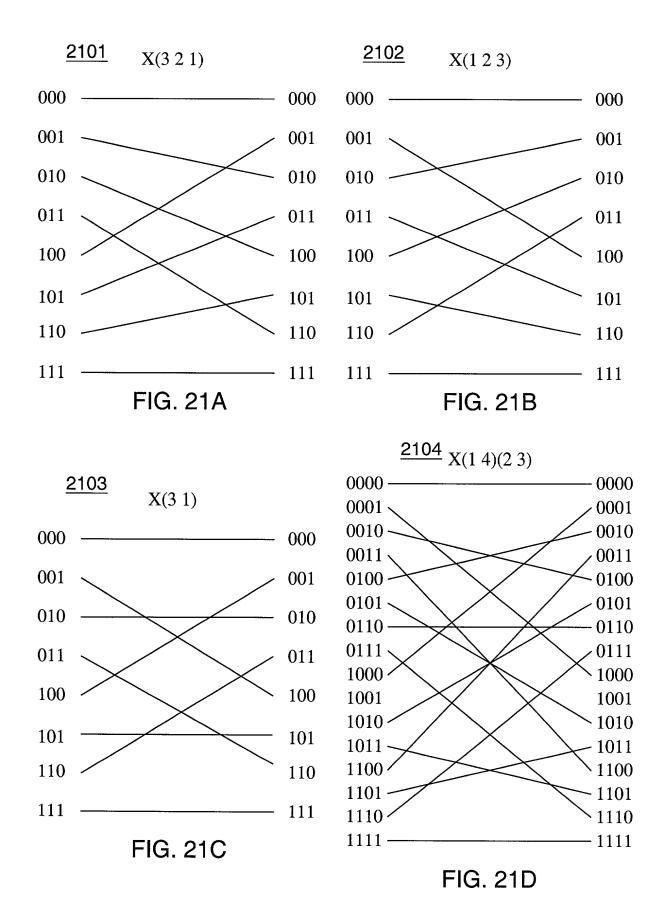
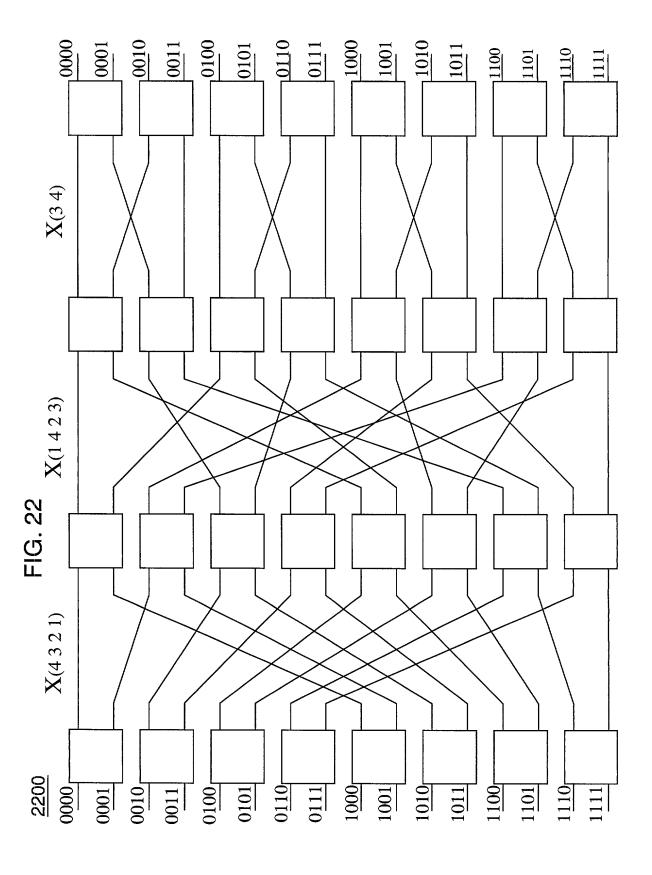
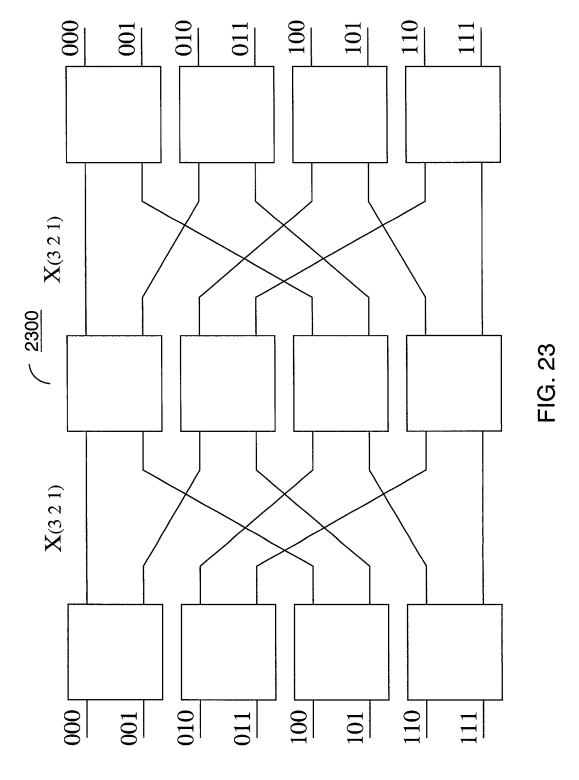


FIG. 20



Open Oppo





# <u>2400</u>

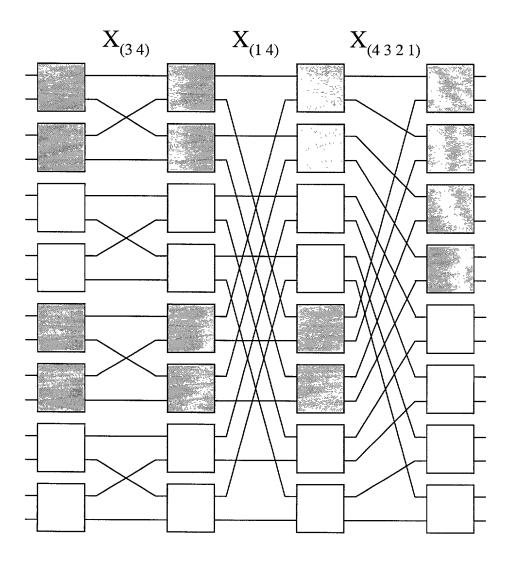
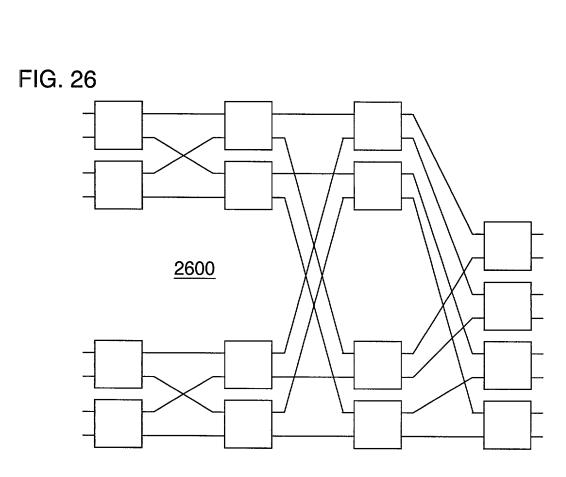
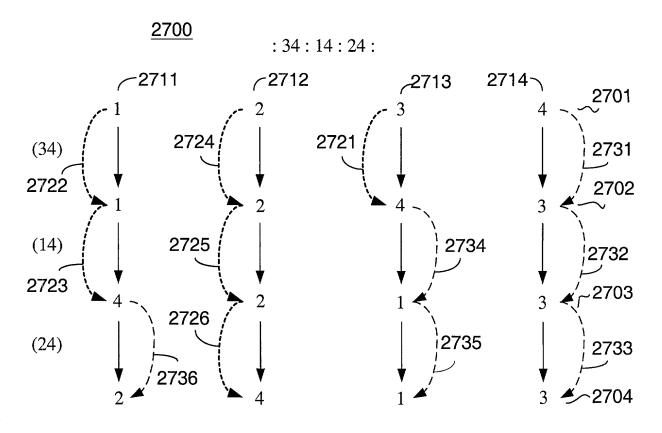


FIG. 24

2500





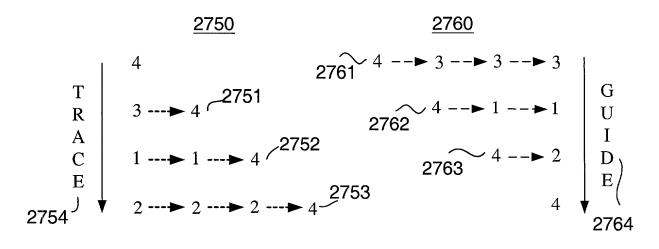


FIG. 27

Trace 
$$\begin{pmatrix} 4321 \end{pmatrix} & \vdots & (14) & \vdots & (24) & \vdots & (34) & \vdots \\ 1 & \Longrightarrow & 4 & & & & \\ 2 & \Longrightarrow & 1 & \Longrightarrow & 4 \\ 2 & \Longrightarrow & 2 & \Longrightarrow & 2 & \Longrightarrow & 4 \\ 4 & \Longrightarrow & 3 & \Longrightarrow & 3 & \Longrightarrow & 4$$

FIG. 28A

$$(4321) : (14) : (24) : (34) :$$

$$4 \longrightarrow 1 \longrightarrow 1 \longrightarrow 1$$

$$4 \longrightarrow 2 \longrightarrow 2$$

$$4 \longrightarrow 3$$

$$4 \longrightarrow 3$$

$$4 \longrightarrow 3$$

FIG. 28B

Political to the first term to the term to the term to the

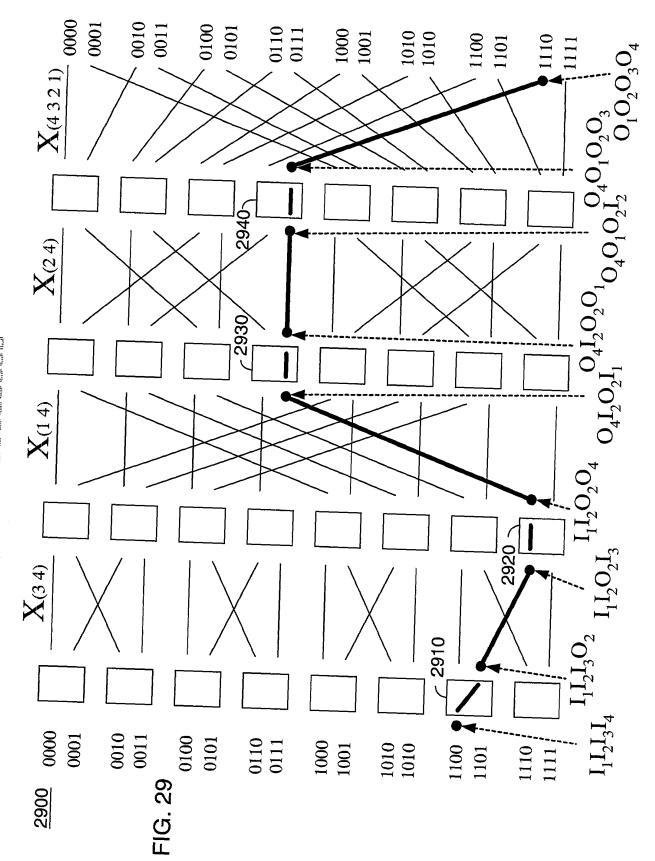
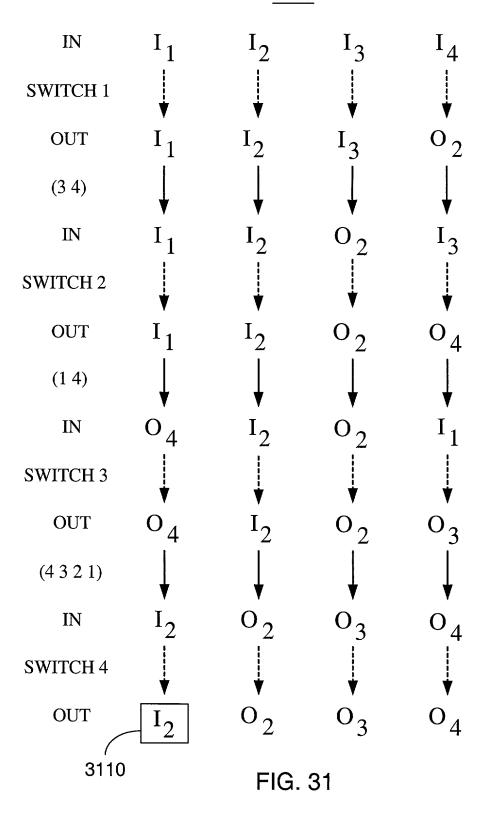


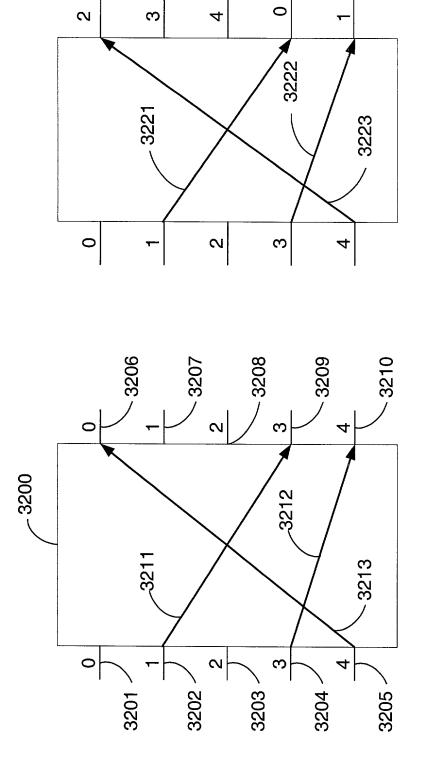
FIG. 30A

Trace 
$$\begin{array}{c} : (34) : (14) : (4321) : \\ 4 \\ \hline 3 \rightarrow 4 \\ \hline \downarrow 3 \rightarrow 4 \rightarrow 1 \rightarrow 4 \\ \hline \end{array}$$

### FIG. 30B

#### <u>3100</u>





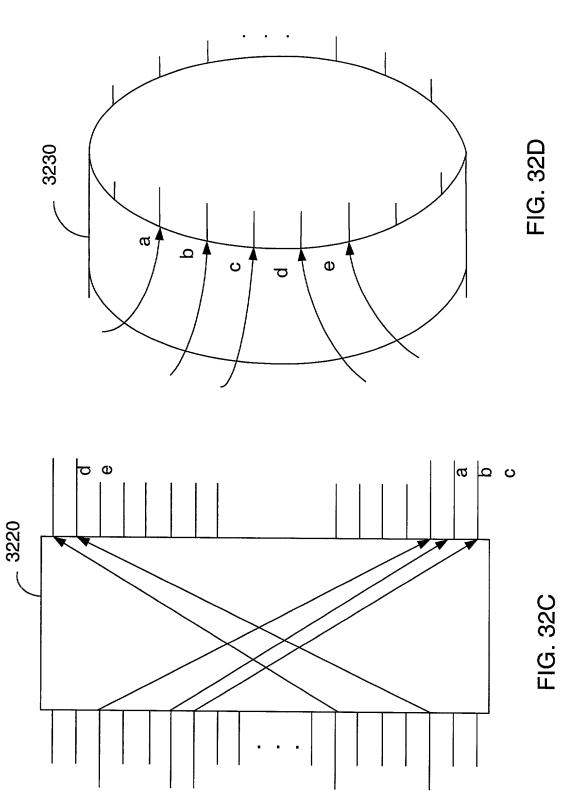
0

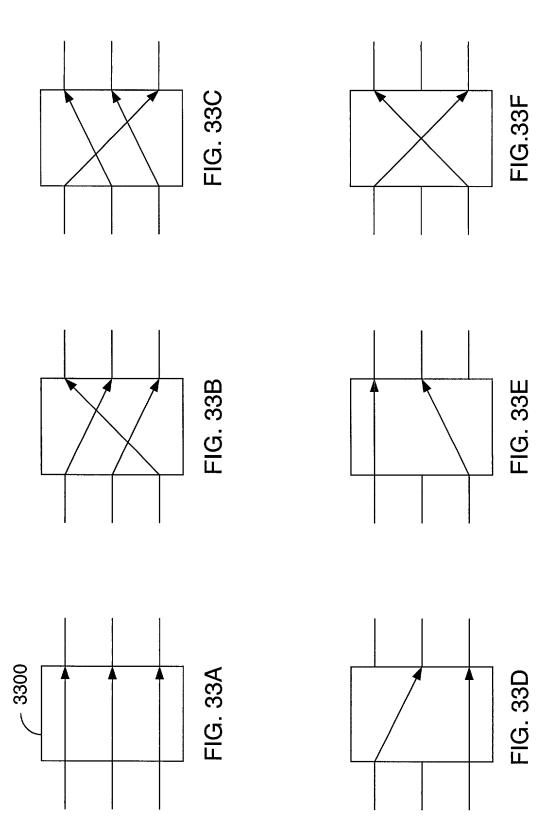
4

Q

FIG. 32B

FIG. 32A





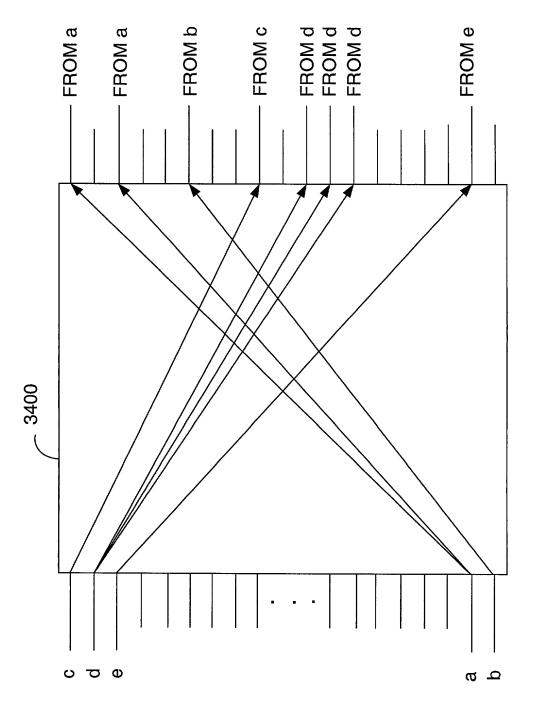
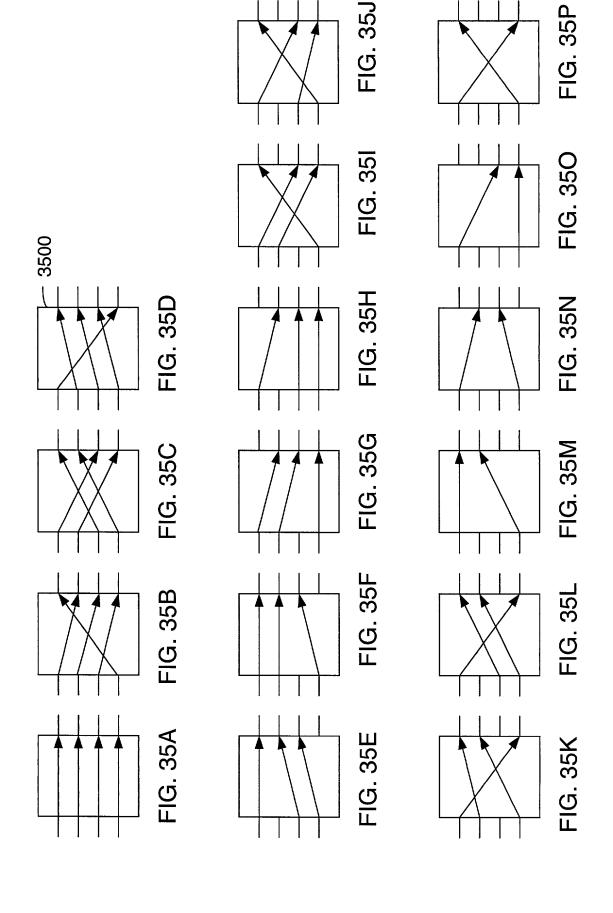
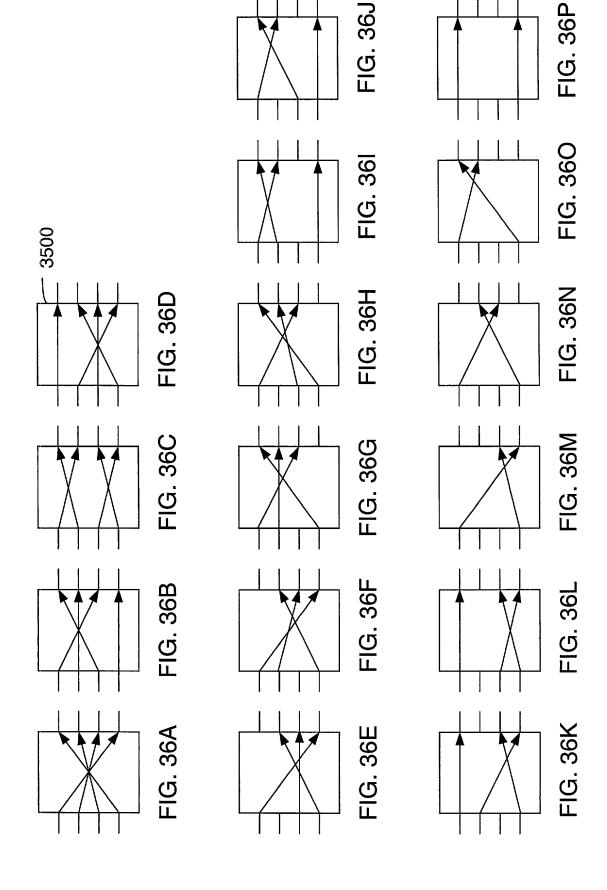
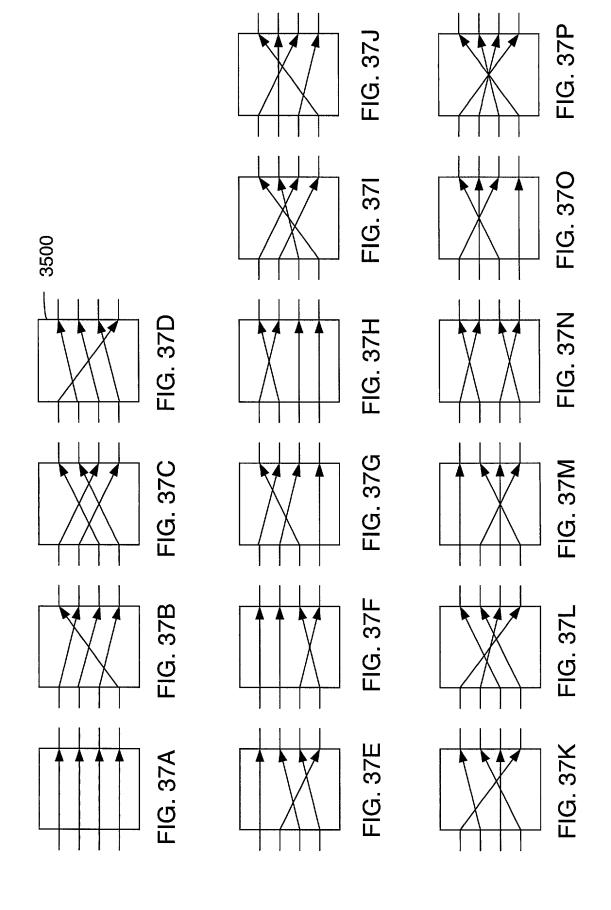
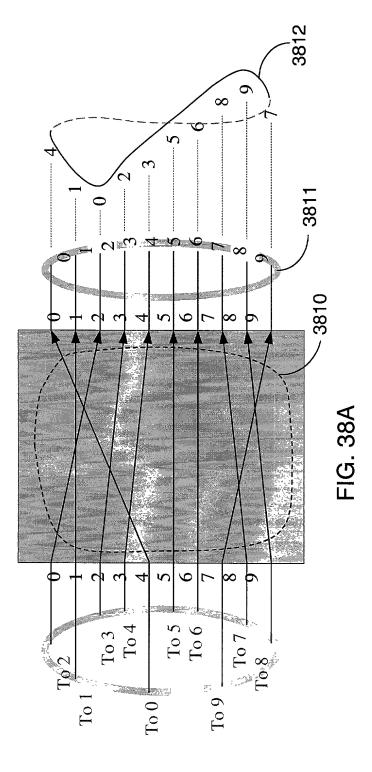


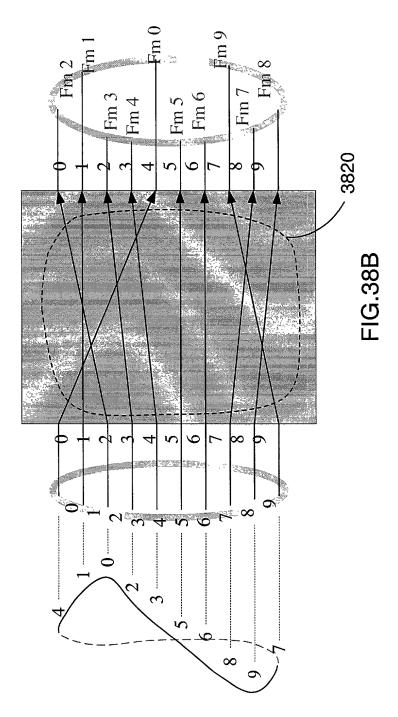
FIG. 34











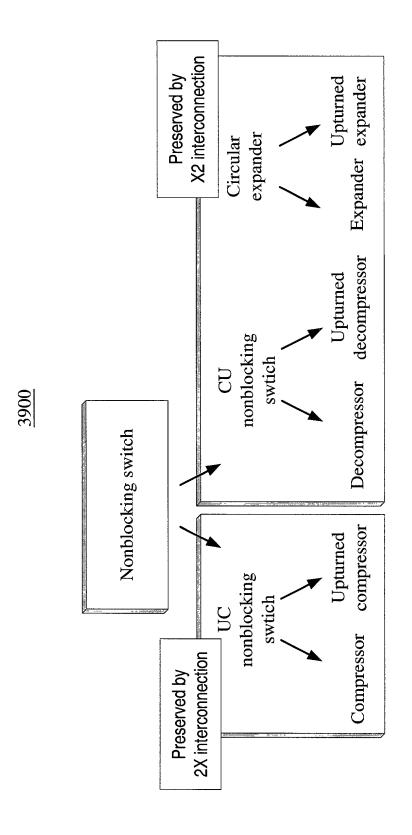
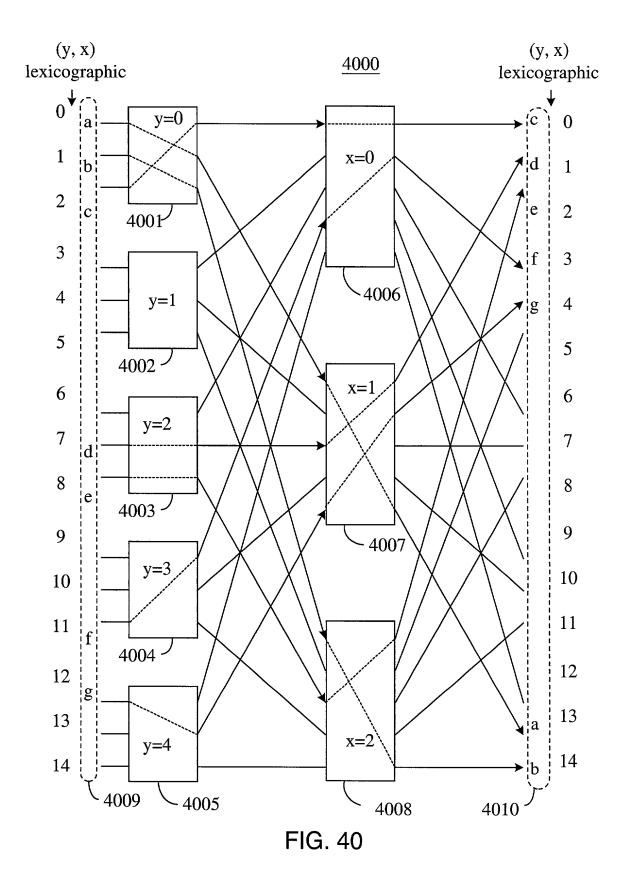


FIG. 39



Preservation of the (1) compressor, (2) upturned compressor and (3) UC nonblocking properties of a switch

Recursive 2X constructions from arbitrary building blocks

Recursive 2X constructions from cells

Banyan-type networks with monotonically decreasing trace and guide

## <u>4110</u>

Preservation of the (4) decompressor,

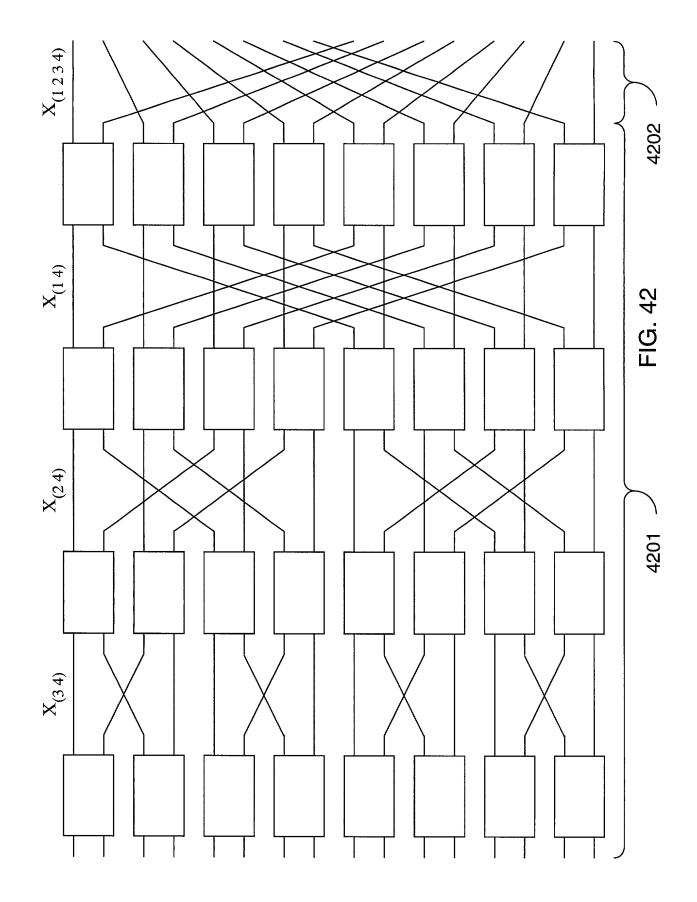
- (5) upturned decompressor,
  - (6) CU nonblocking,(7) expander,
- (8) upturned expander and
  - (9) circular expander properties of a switch

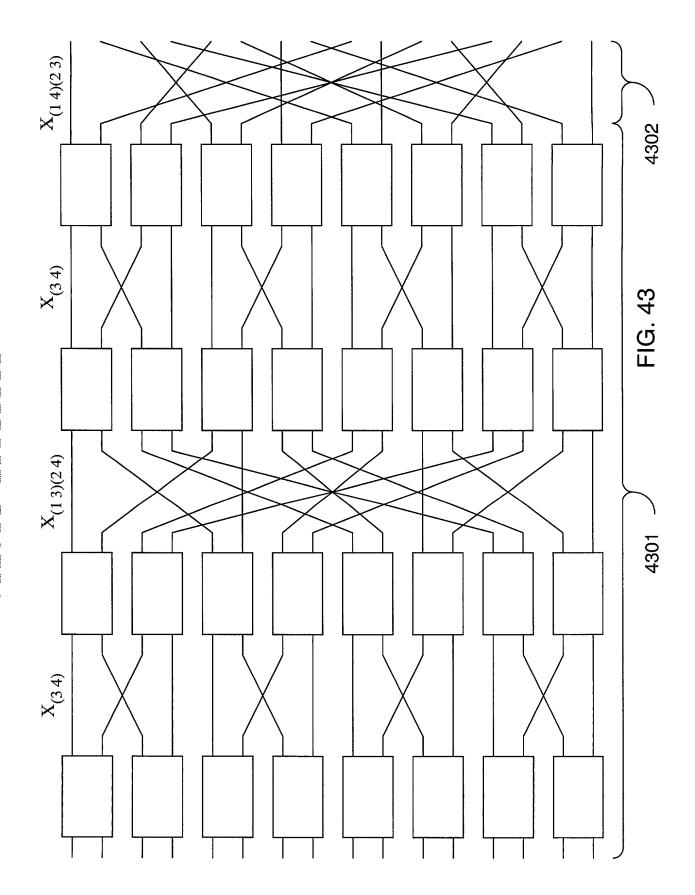
Recursive X2 constructions from arbitrary building blocks

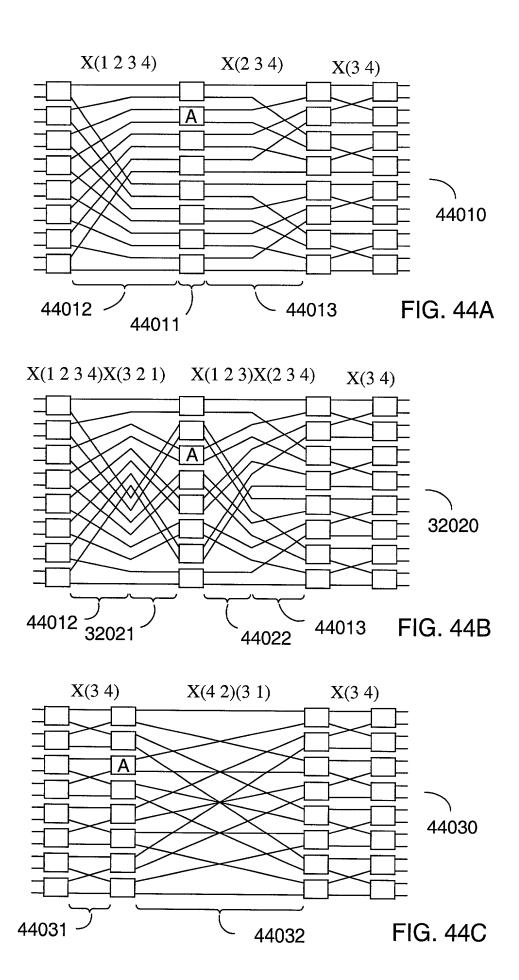
Recursive X2 constructions from cells

Banyan-type networks with monotonically increasing trace and guide

FIG. 41







(<==> common trace and guide

Equivalence requiring the

match of I/O exchanges

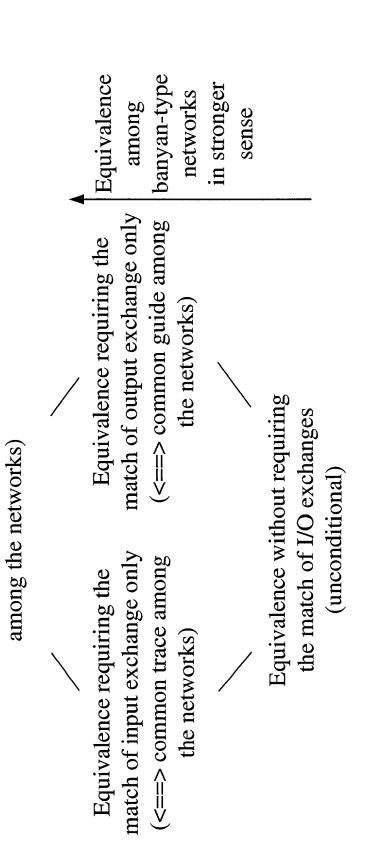


FIG. 4

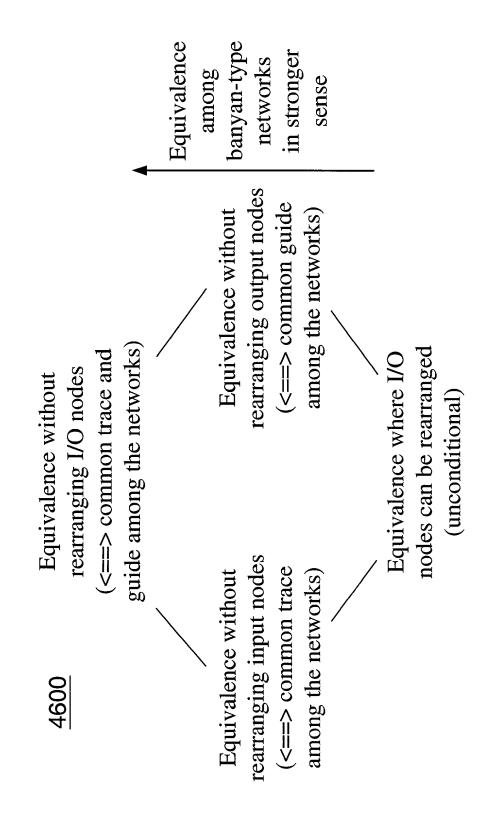


FIG. 46

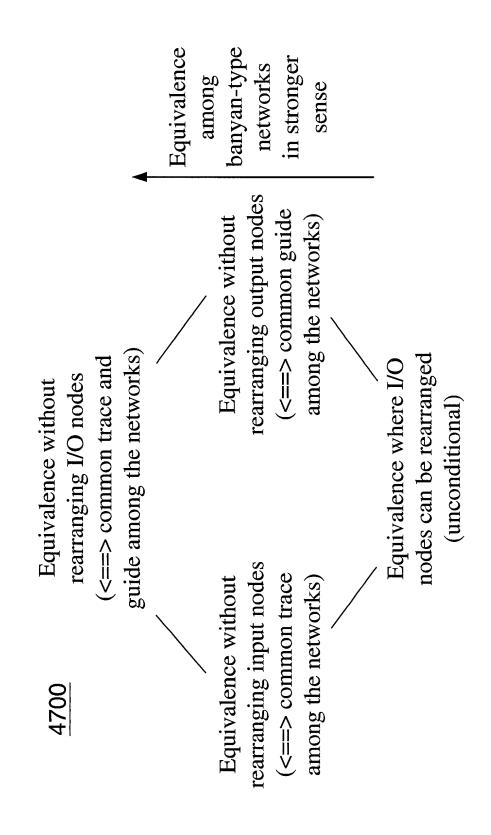
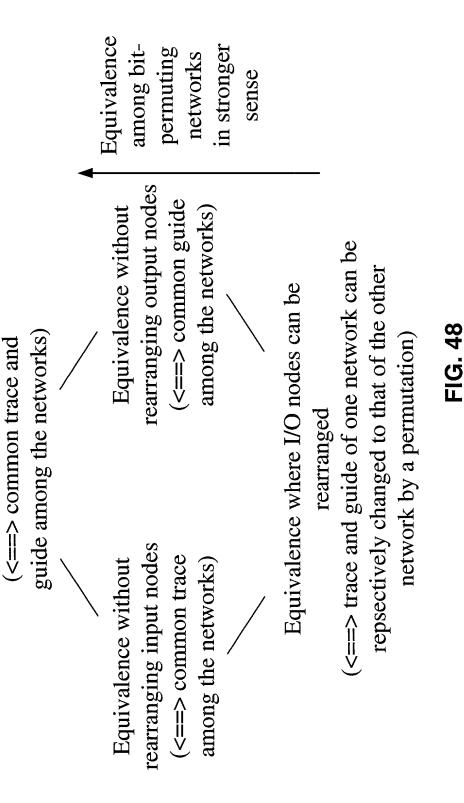


FIG. 47

rearranging I/O nodes

4800

Equivalence without



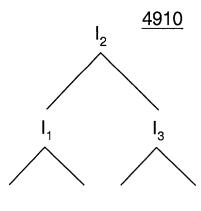


FIG. 49A

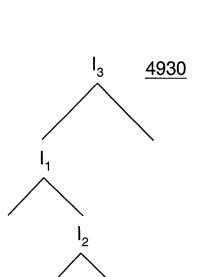
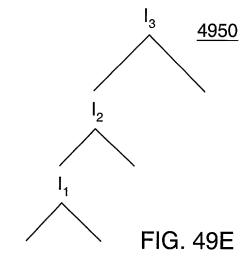


FIG. 49C



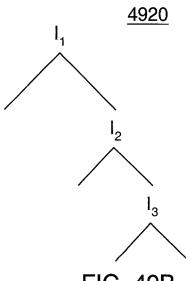


FIG. 49B

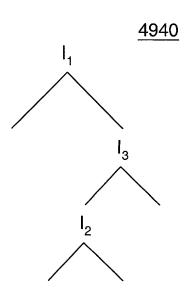
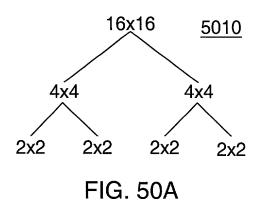
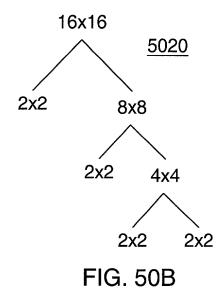
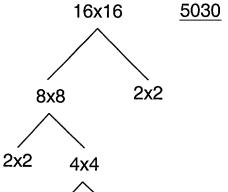
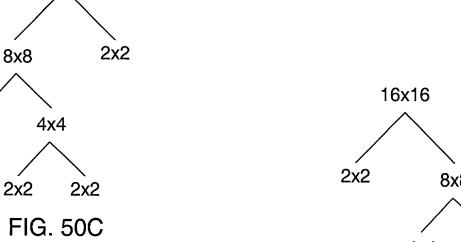


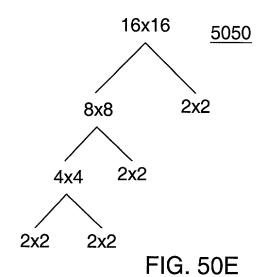
FIG. 49D

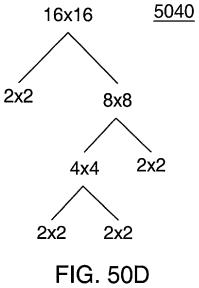












# <u>5100</u>

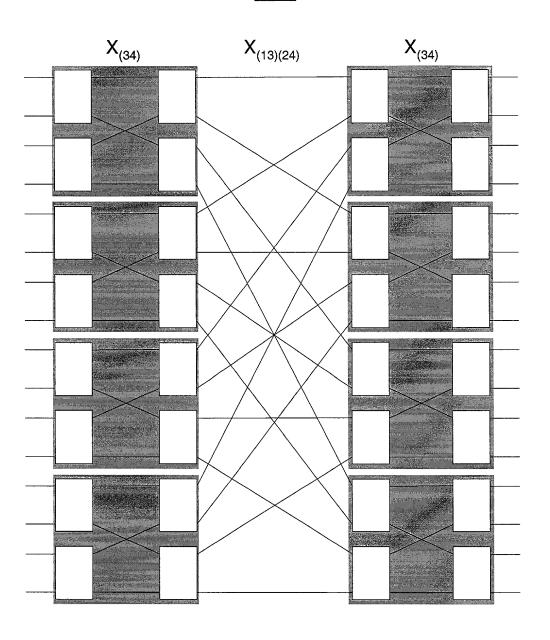


FIG. 51

# <u>5200</u>

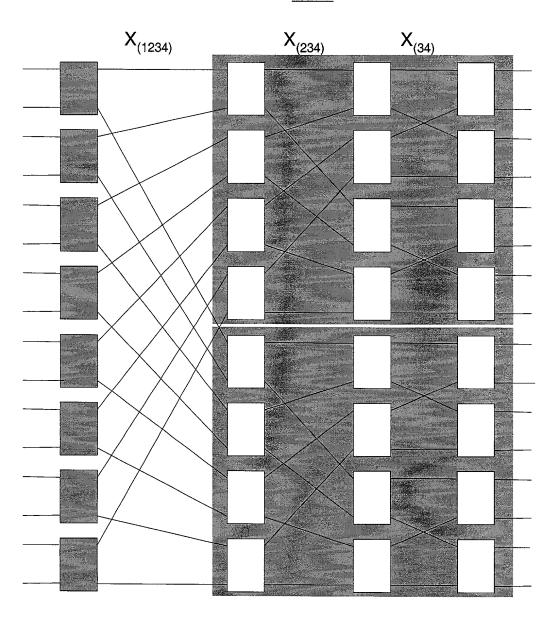
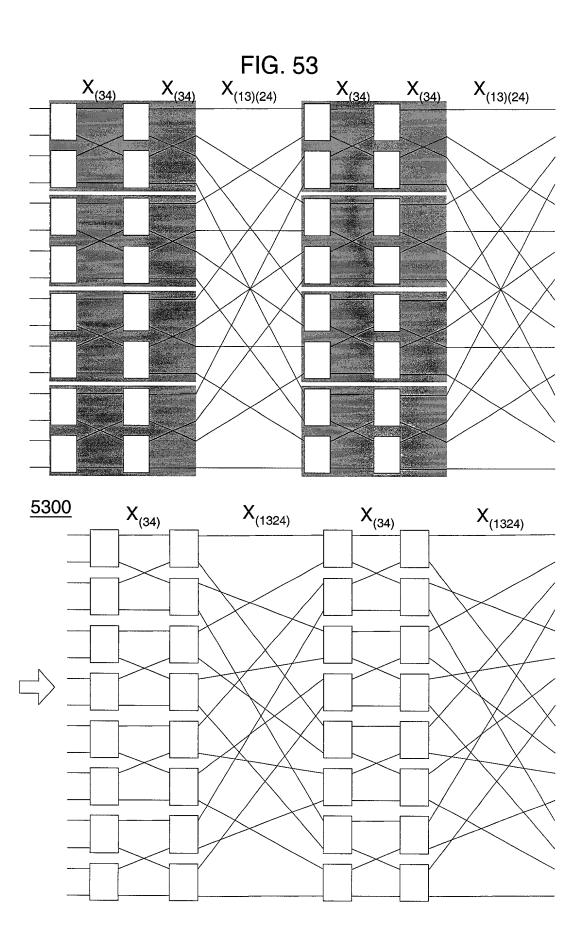


FIG. 52



# <u>5400</u>

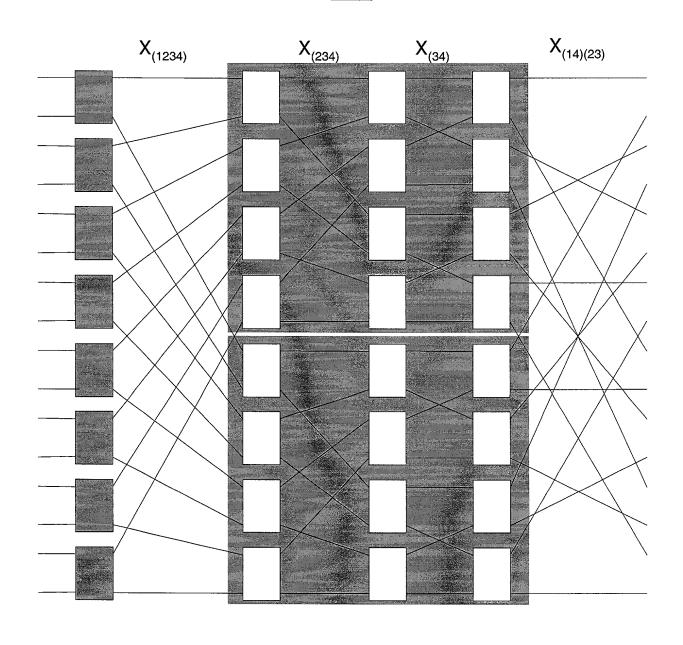


FIG. 54

# <u>5500</u>

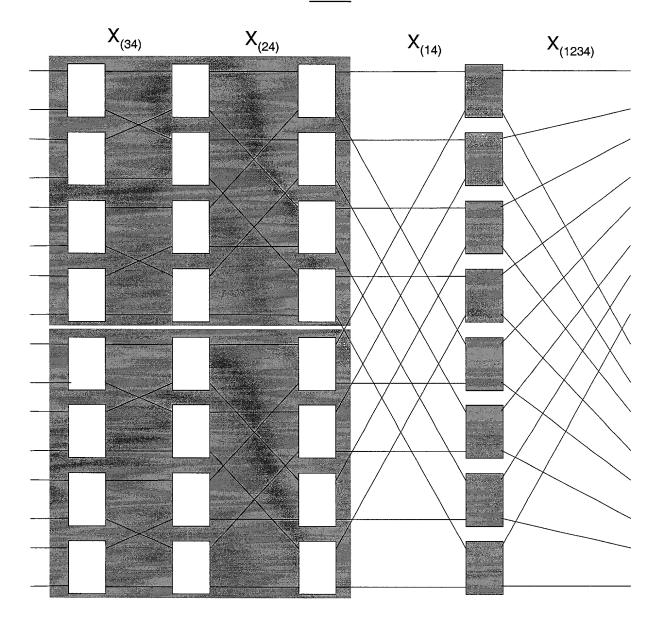
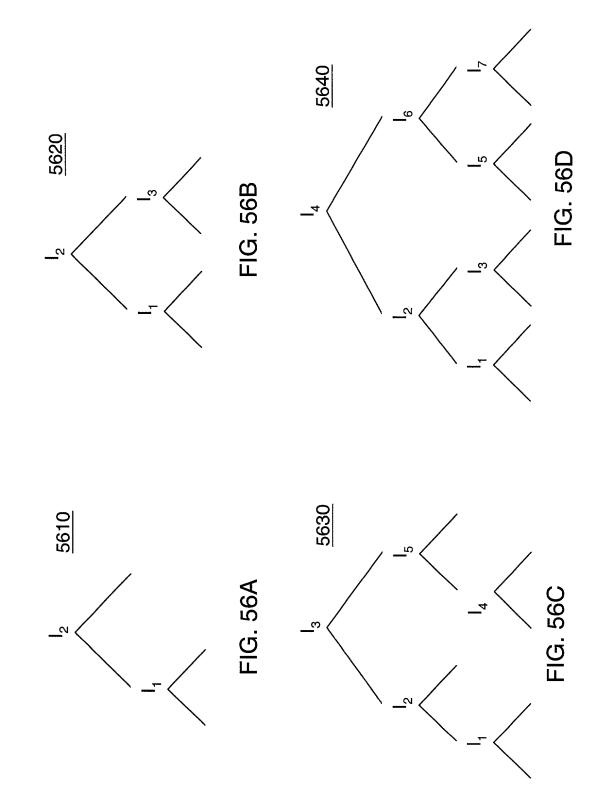
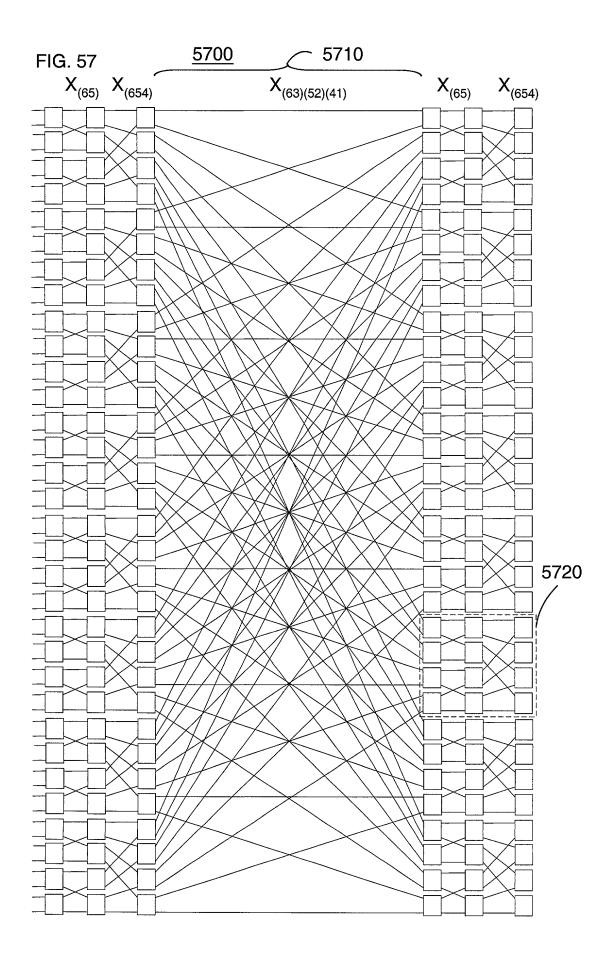
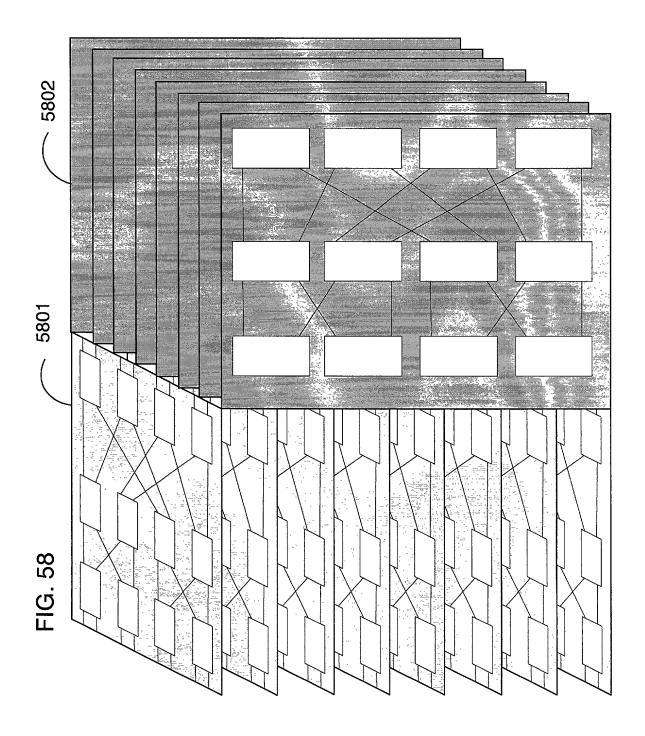


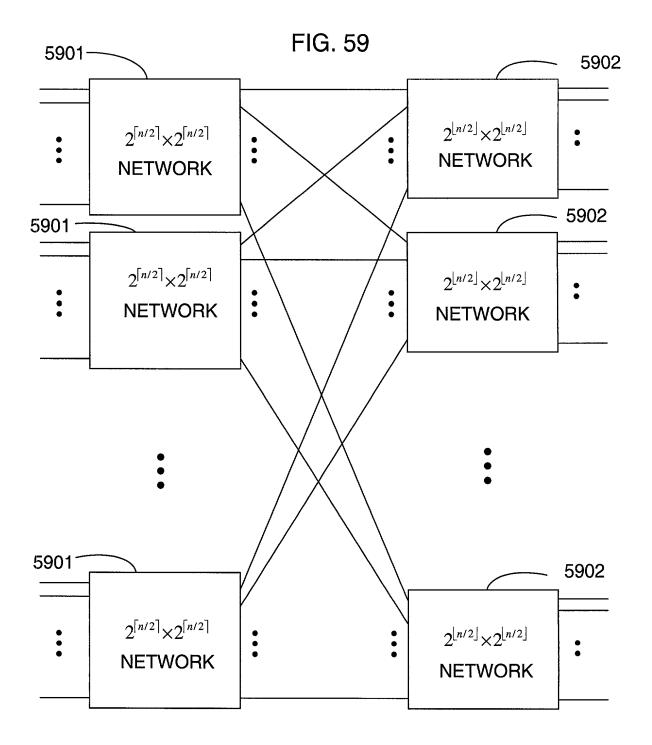
FIG. 55

11 117 - 139









# <u>6000</u>

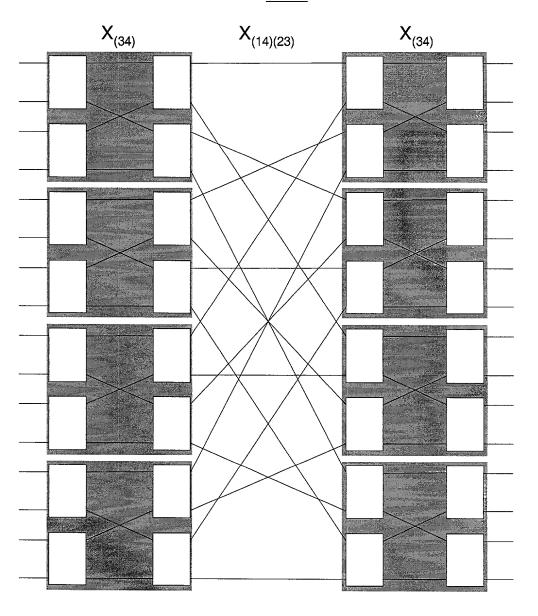
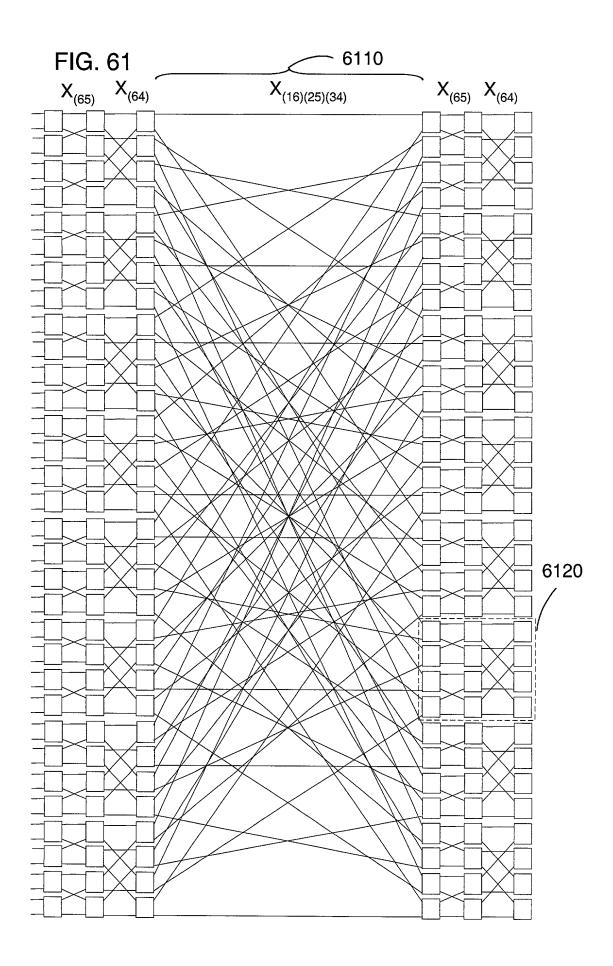


FIG. 60

9 (0.7.19)



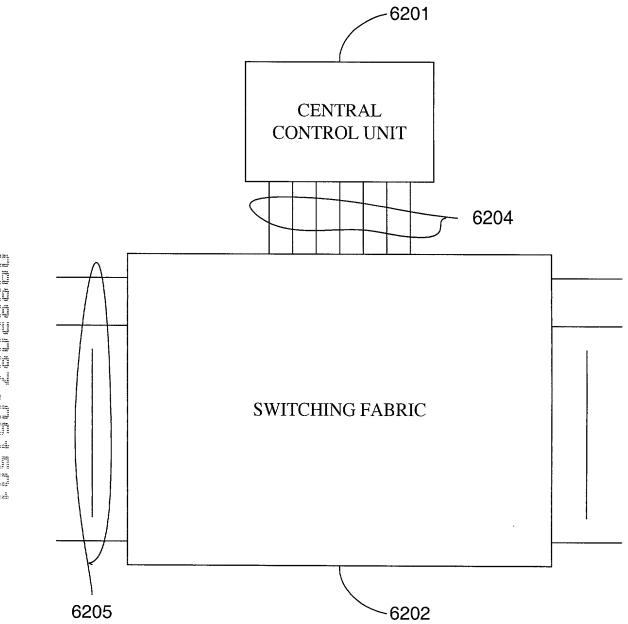


FIG. 62A

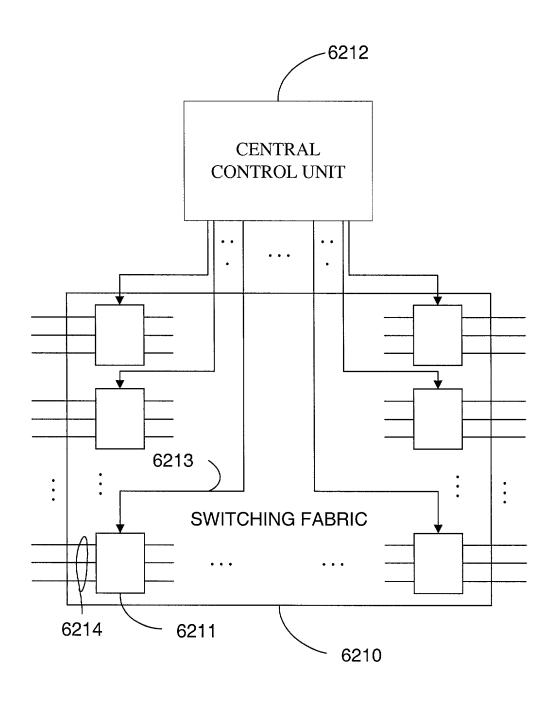
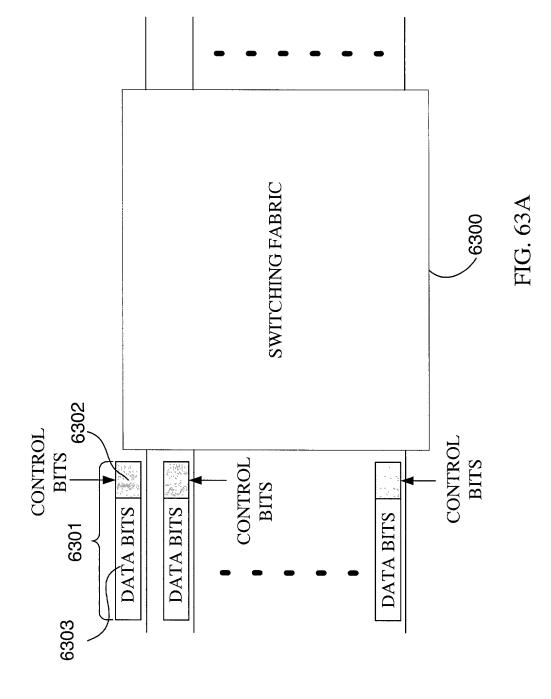


FIG. 62B



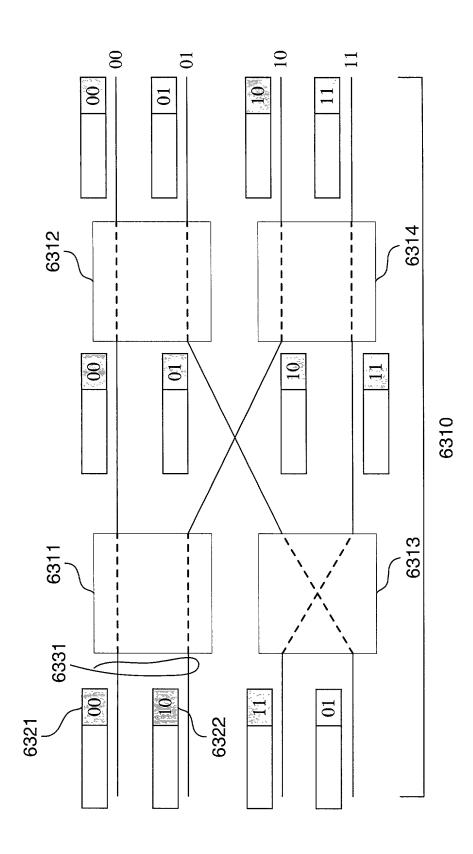


FIG. 63B

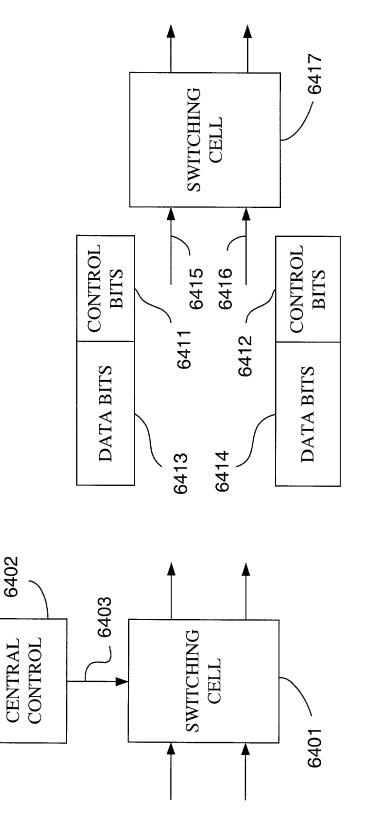
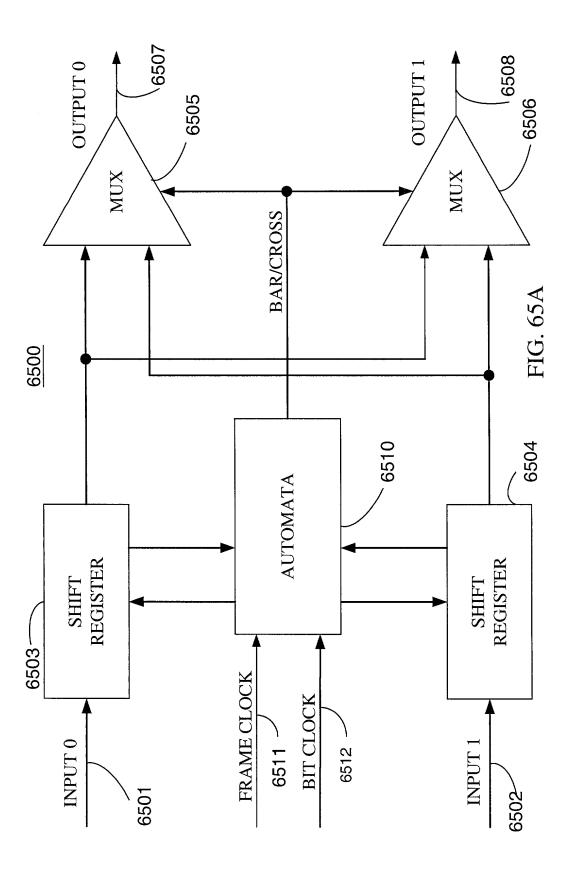


FIG. 64B

FIG. 64A



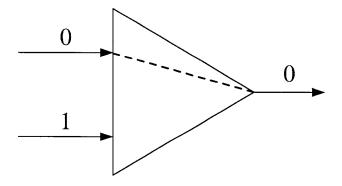


FIG. 65B

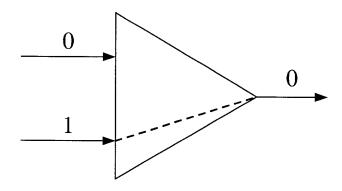


FIG. 65C

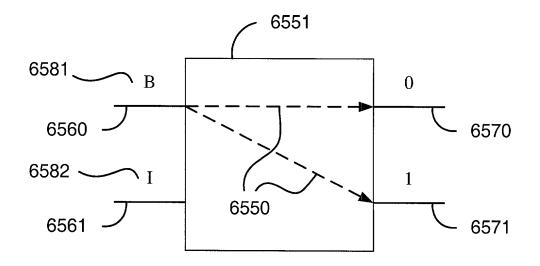


FIG. 65D

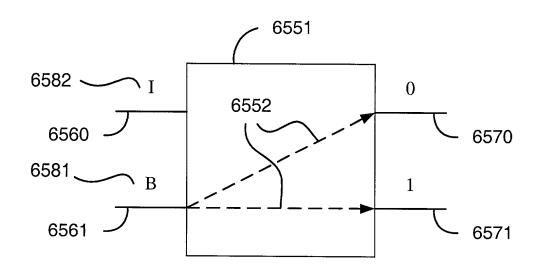


FIG. 65E

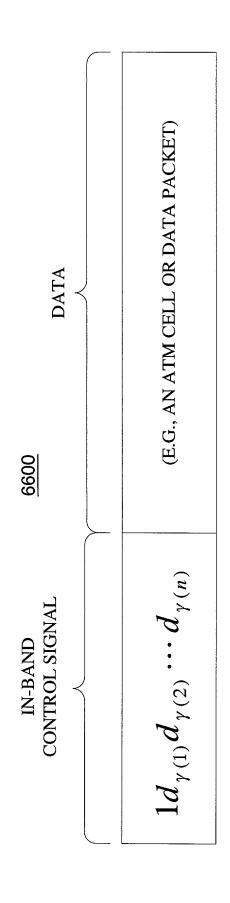


FIG. 66A

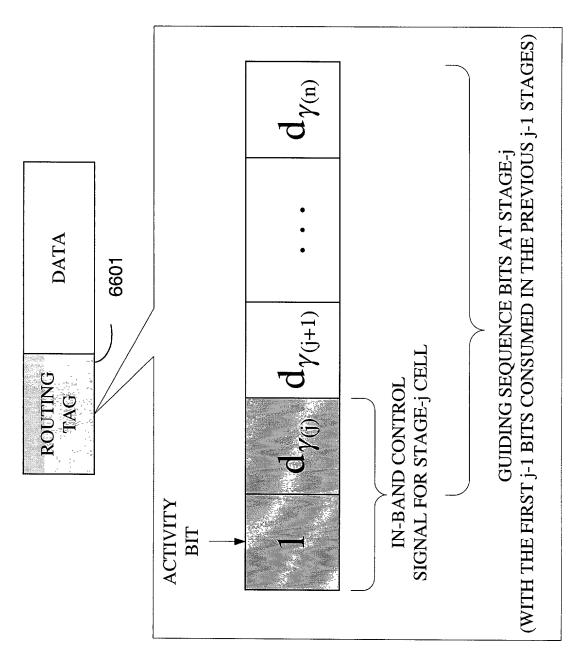
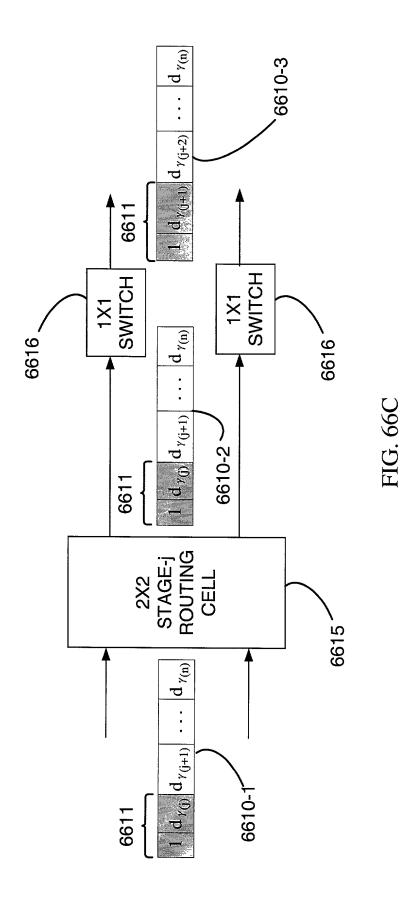
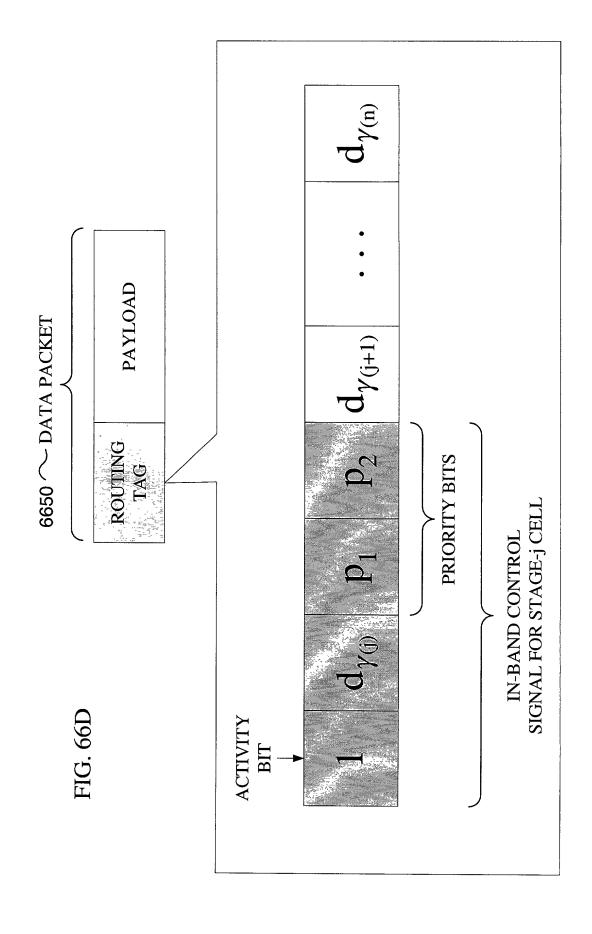
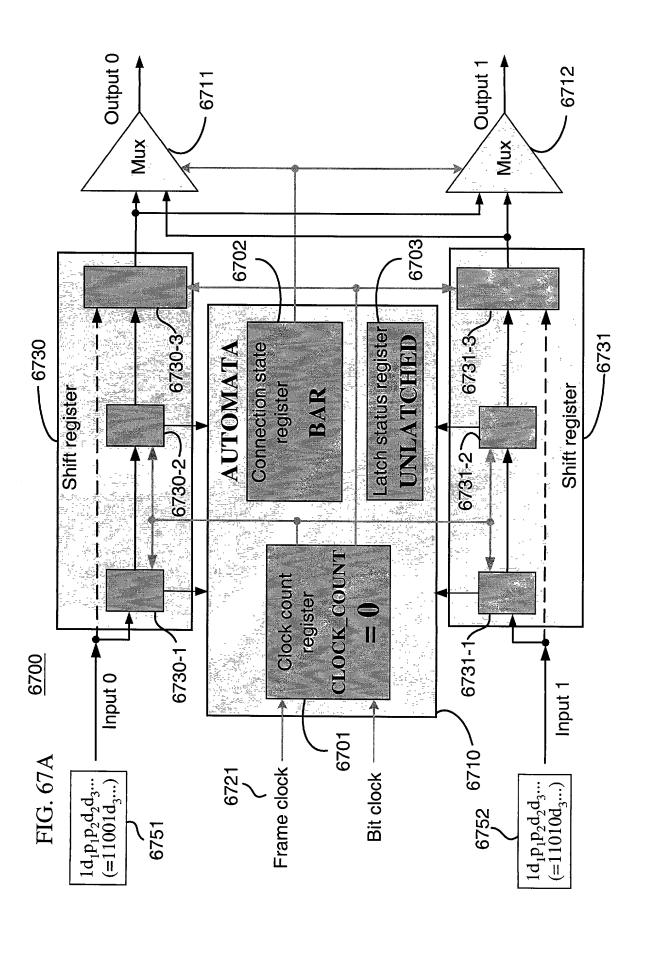
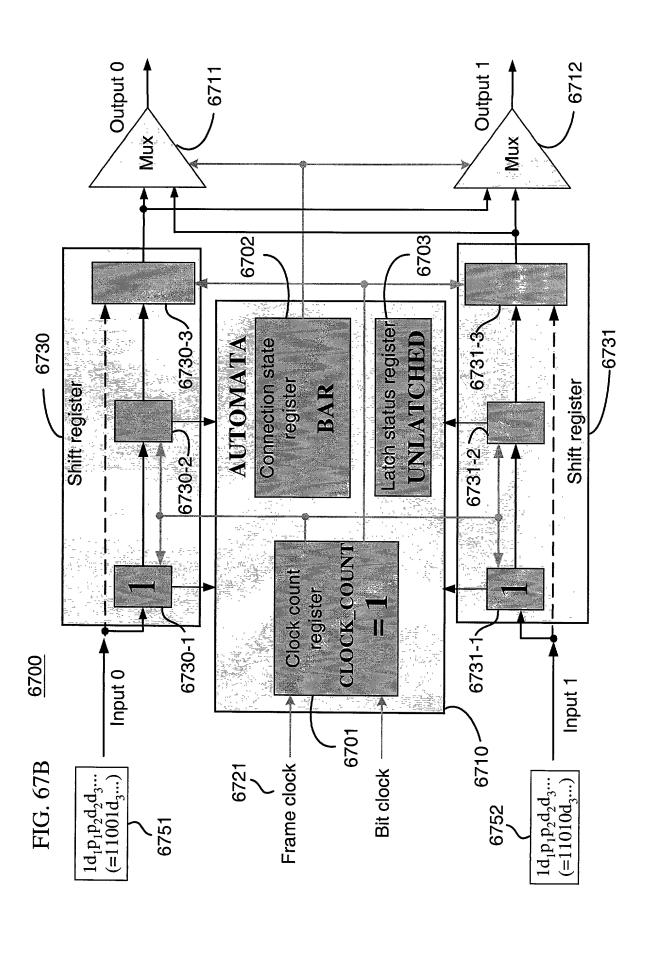


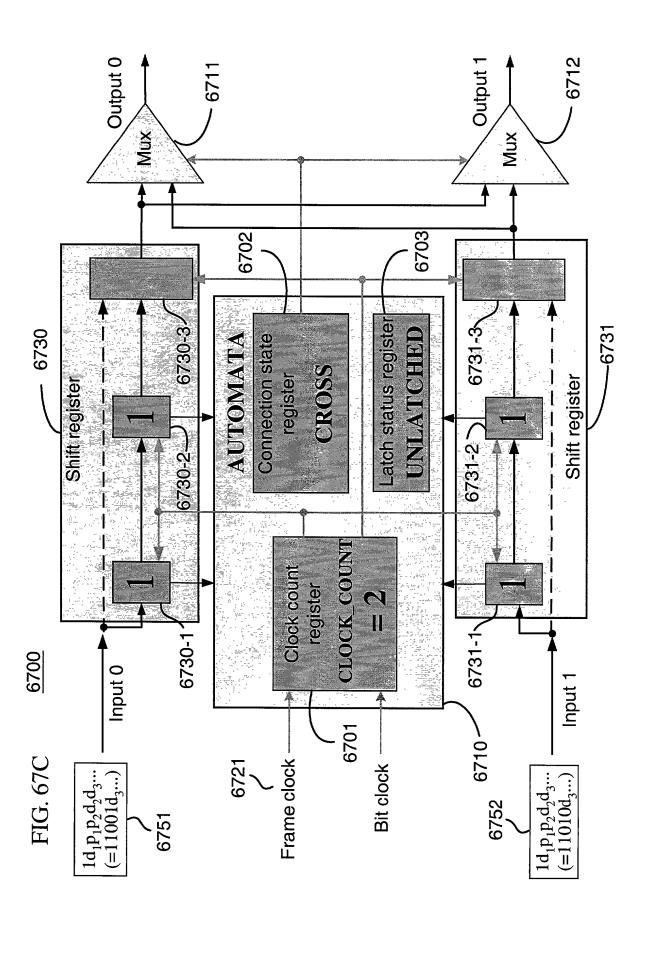
FIG. 66B

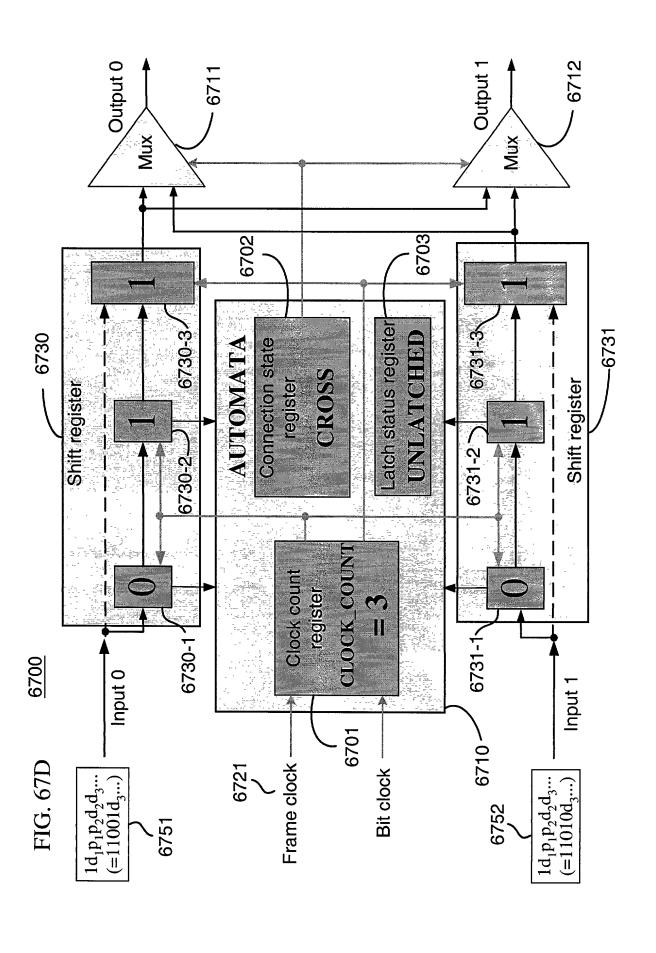


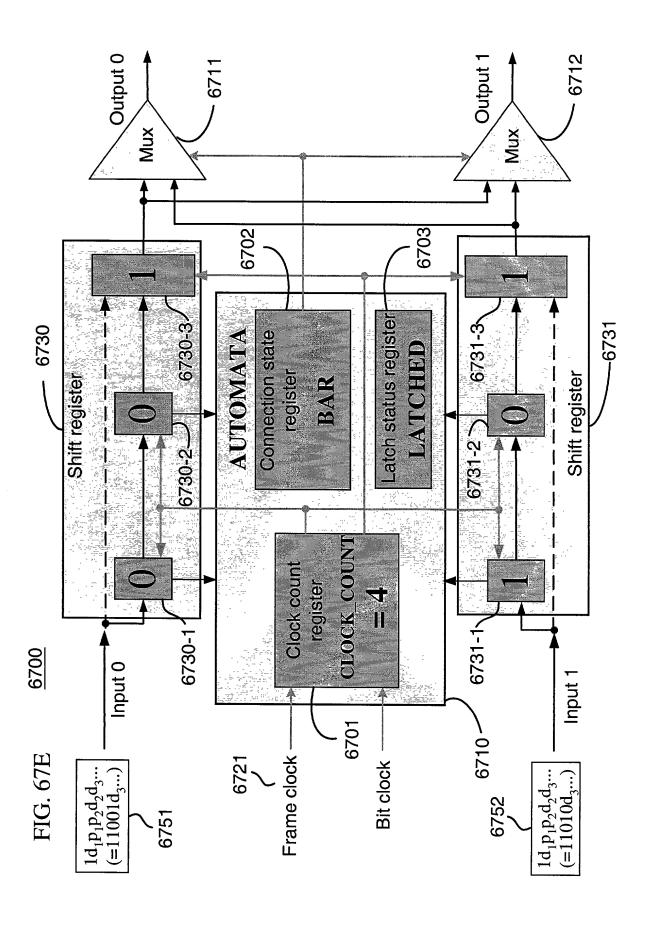


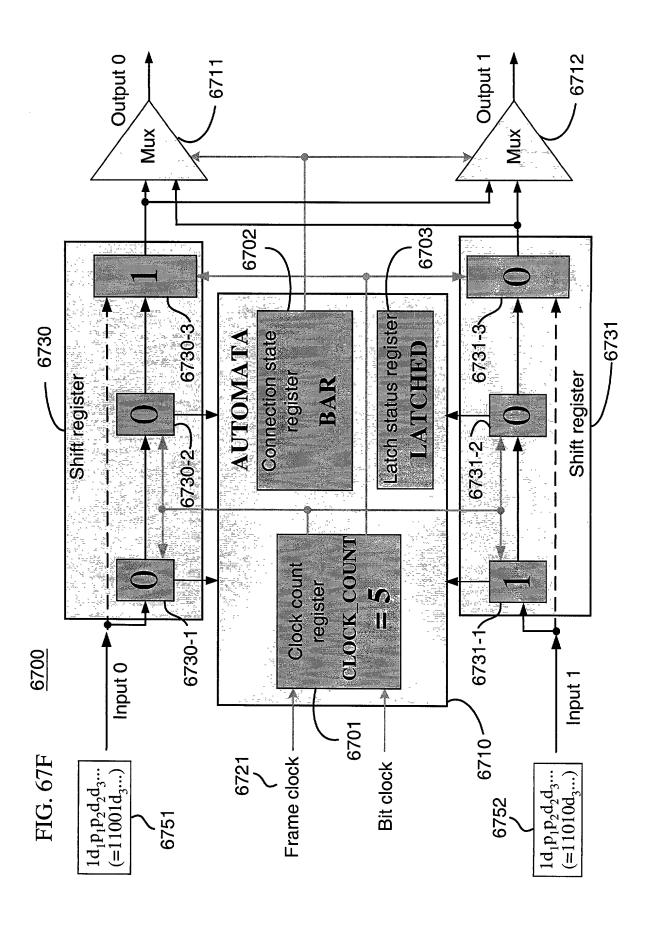












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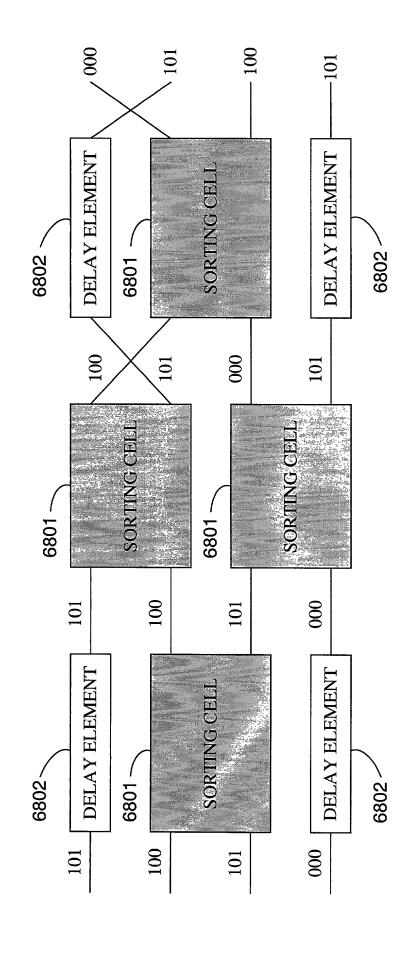
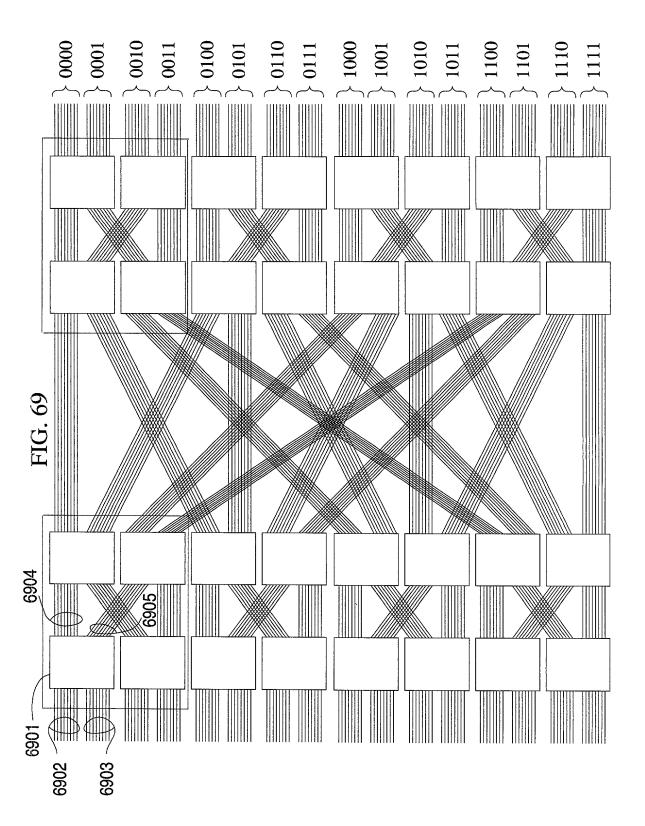
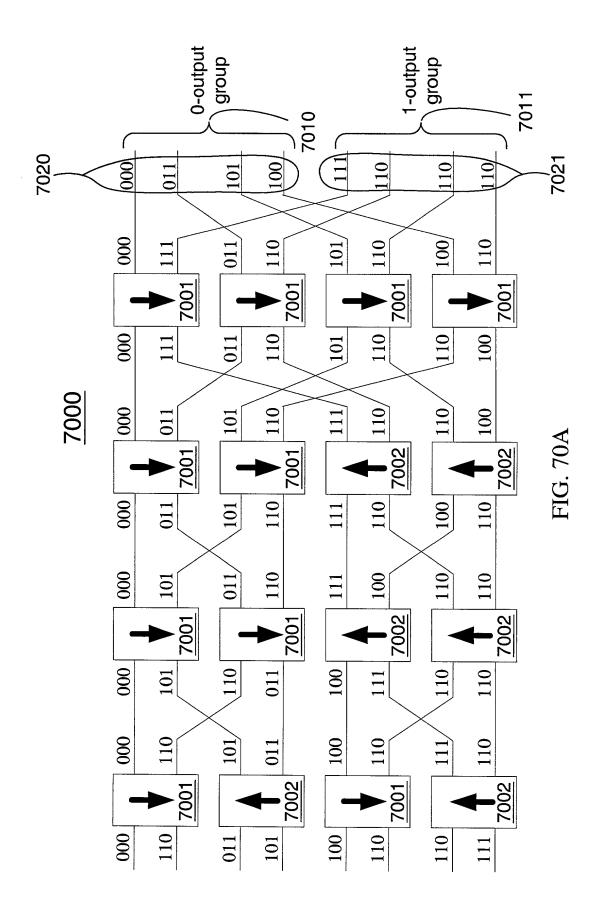
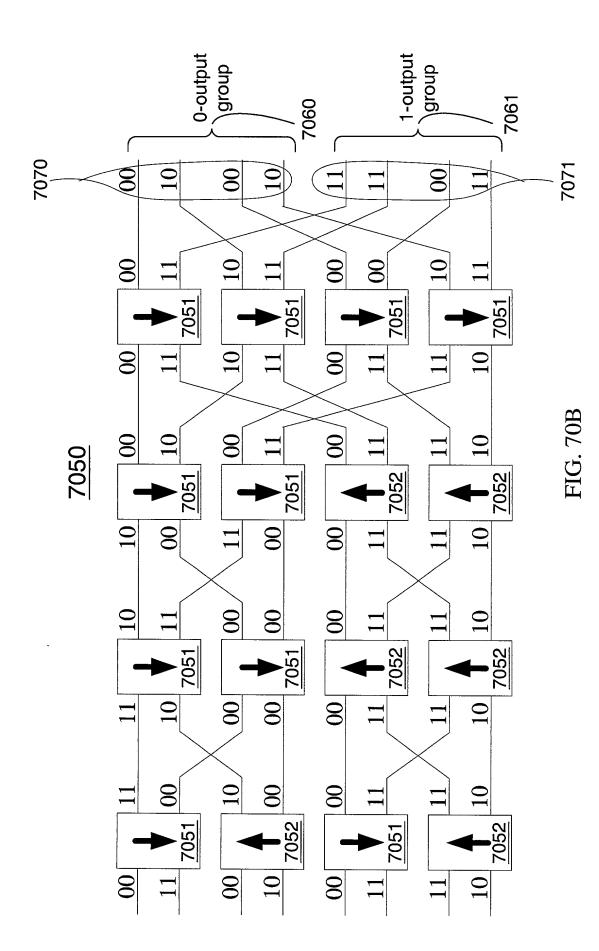


FIG. 68





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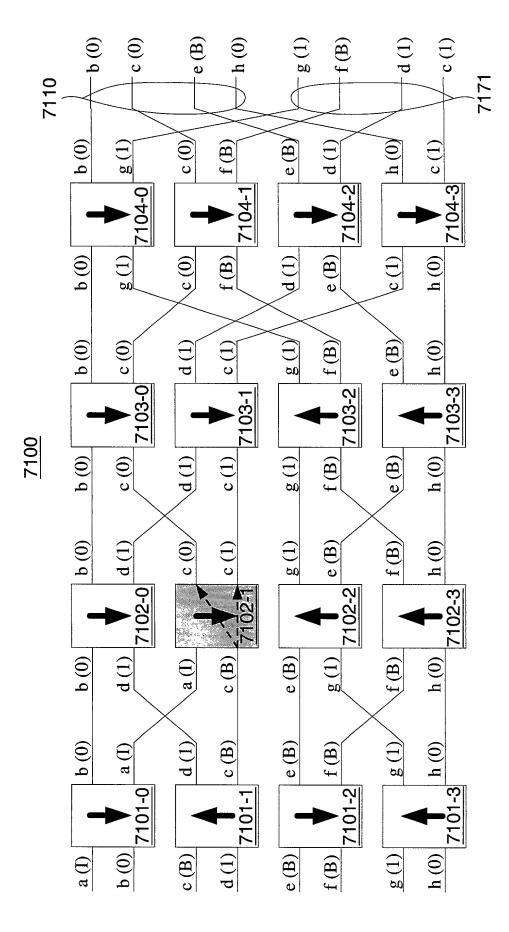
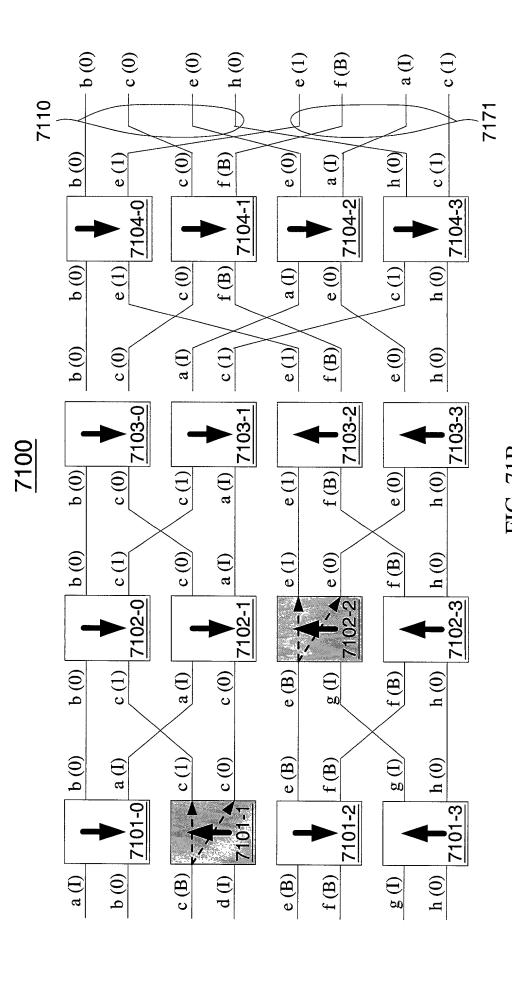
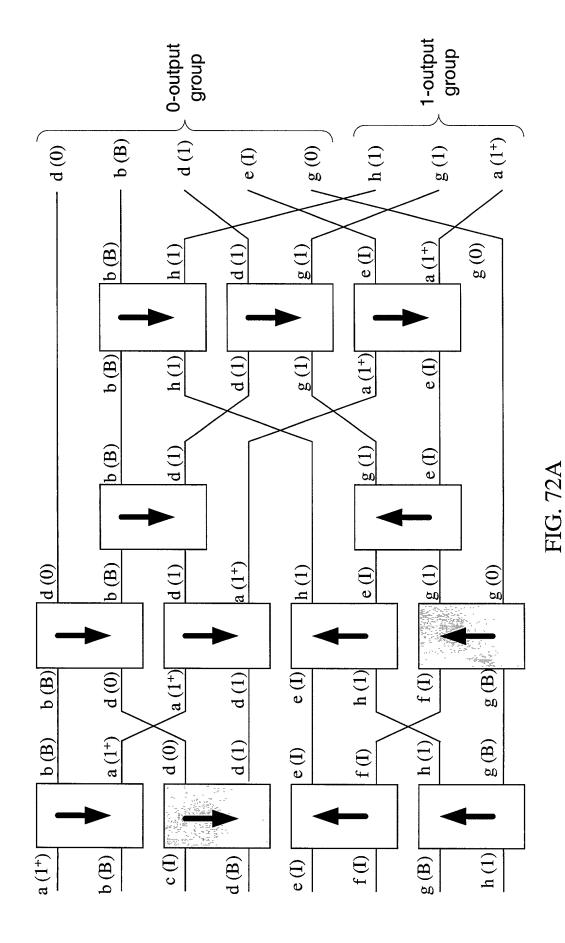
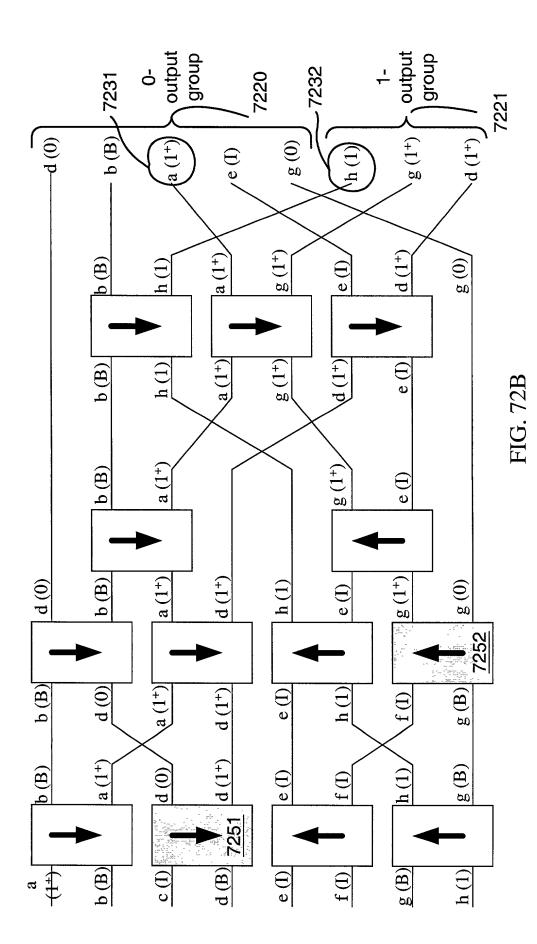


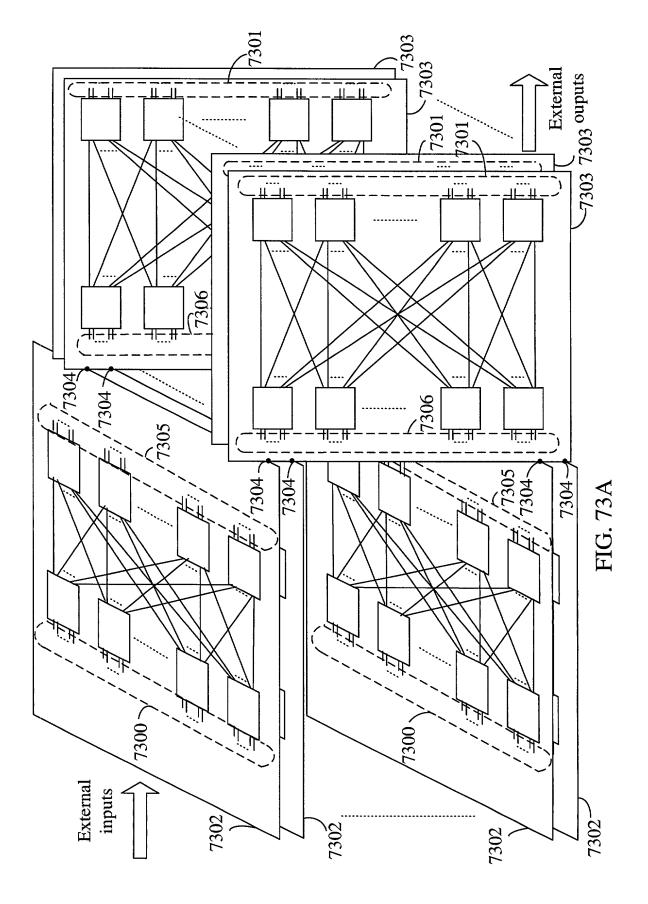
FIG. 71A

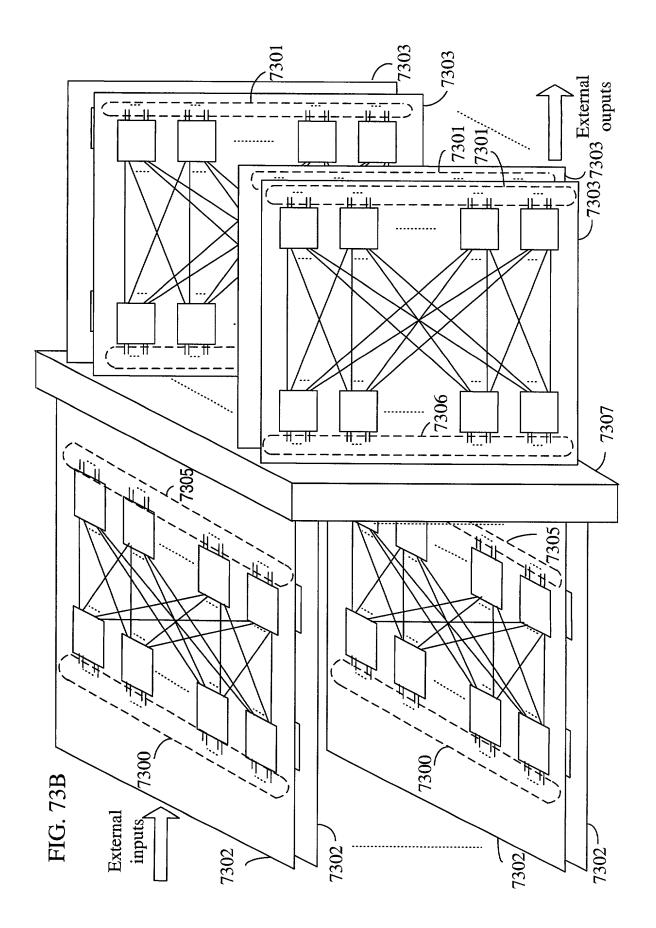


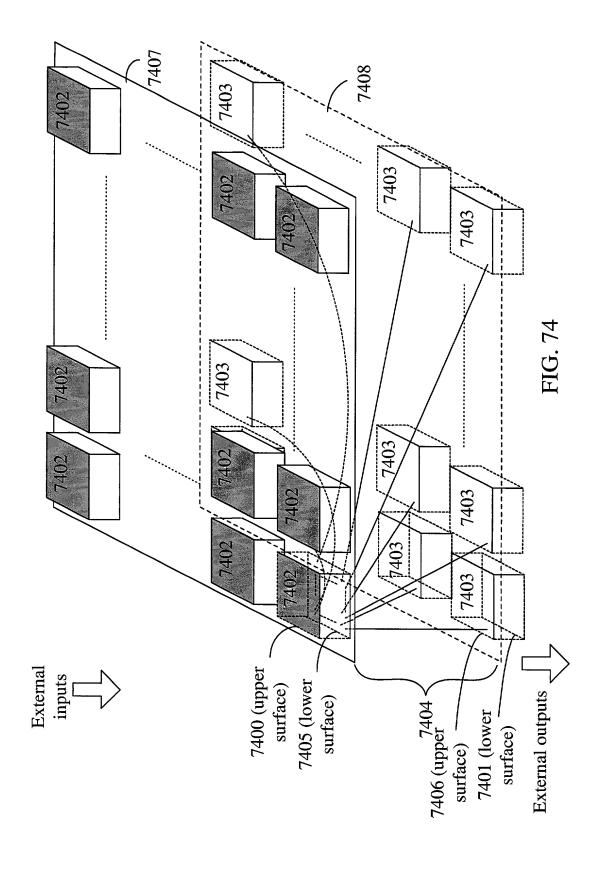


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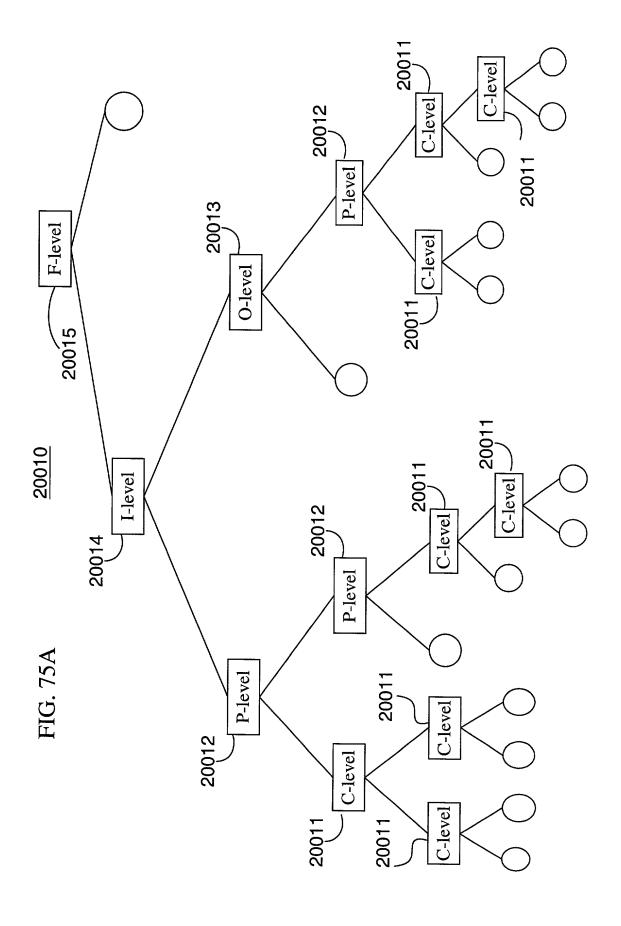








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